MANUAL
of
ARTIFICIAL LIMBS

A. A. MARKS

NEW YORK

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MANUAL

OF

ARTIFICIAL LIMBS

COPIOUSLY ILLUSTRATED

Artificial Toes, Feet, Legs, Fingers, Hands, Arms, for Amputations and Deformities, Appliances for Excisions, Fractures, and other Disabilities of Lower and Upper Extremities, Suggestions on Amputations, Treatment of Stumps, History, etc., etc., etc.

AN EXHAUSTIVE EXPOSITION OF PROTHESIS

A. A. MARKS

701 Broadway, New York, N. Y., U. S. A.

1907

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BY
A. A. MARKS

PREFACE

MANUAL OF ARTIFICIAL LIMBS is the title given to this book to distinguish it from the Treatise and all other publications which it succeeds and supplants. It is in no sense a catalogue, although containing the information usually given in catalogues; but it is a true manual of the subject of prothesis and the most exhaustive work ever produced on that topic. Prothesis or prosthesis is defined by Webster as "The process of adding to the human body some artificial part in place of one that may be wanting."

The Manual thus treats of all losses and impairments of the extremities, whether caused by accident, disease or birth, shows what they are and clearly describes how they may be repaired by artificial methods.

The Manual is divided into chapters, each devoted to a distinct phase of the subject or to a particular part of the leg or arm under discussion.

The illustrations are designated by letters and numbers for convenience of reference. For example, partial foot amputations are discussed in Chapter III, and the illustrations in that chapter all have the letter C and are numbered in order, 1, 2, 3, etc. Amputations of different sections of the legs and arms are similarly divided and the illustrations numbered in the same manner. This gives definiteness and avoids confusions with earlier publications.

The need of the Prothesist becomes more and more urgent every day. Losses of limbs by accidents and injuries of every kind are constantly multiplying, and the demands made upon the thoughtful and skillful maker of artificial limbs and other surgical apparatus increase in the same proportion.

The successful maker cannot confine himself to the narrow methods of former times. Specific treatment is now called for in almost every case, the peculiarities of each requires closer study, separate methods must be devised by which complicated cases can be treated more skillfully and reparation more complete. These are advanced methods, called for by the progress of the science and necessitated by the importance of the work required. The skillful maker thus occupies a much more prominent position than can be filled by those who persist in clinging to archaic systems. It has been said by those most competent to judge that the house of A. A. Marks through persistent endeavor, broad enterprise, attentive study and a real sense of the importance of the work has earned and occupies the foremost position in its branch of industry.

While the loss of a limb is a serious personal deprivation, it is no longer regarded as a grievous or irreparable one. There are many thousands of people who walk, work and mingle with other people without disclosing their own loss and without suffering. The absence of a leg or an arm, therefore, is now regarded, and quite rightly, as one of the minor misfortunes. Testimonials substantiating these statements, and explaining and endorsing the principles presented in this Manual for the construction of artificial limbs, will be found in copious numbers in Chapter XXXVII.

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INTRODUCTION

In reviewing "Manual of Artificial Limbs" and introducing same to the reader privilege is taken to advert briefly to the House itself and its enviable history.

The house of A. A. Marks was founded for the purpose of relieving and helping the maimed and deformed. Established in the year 1853 it has had a continuous existence of more than half a century and has become the leading house of its kind in the world.

Its manufacturing plants, the factory and office in New York City, and the mills in Connecticut, occupy more ground and employ more help than any establishment elsewhere in the world devoted to the manufacture of artificial legs or artificial arms. The business is a large one, conducted in a large way and by men thoroughly familiar with every detail of artificial limb manufacture; men who have brought to it the widest practical knowledge and years of the most attentive study and effort.

Their specialty is the making of artificial legs and arms with rubber feet and hands, of which they are the inventors and patentees. The spring mattress rubber foot and the rubber hand with ductile fingers are the most recent improvements. That the house has grown from a small shop to a vast manufacturing establishment with a hundred thousand correspondents located in all parts of the world is due not only to the intelligent way in which its business has been conducted, but to the inherent merits of its products. These are described at length in the pages which follow and the descriptions are supplemented by innumerable letters from grateful clients.

Modern skill has brought no more useful aid to humanity than the artificial limb which transforms a helpless member of society into a useful one.

The firm does not claim that every maimed and crippled person can be restored to the full use of his extremities by its apparatus. It is reasonable, however, to claim that its skill and facilities enable the firm to help the maimed better and more thoroughly than any other establishment in the world, and as the house has helped so many in the past there is abundant encouragement for the maimed of the future.

This book has been prepared not as an exposition of the firm's business, but as a guide and help to those seeking alleviation.

The firm manufactures limbs for simple amputations as well as for the most complicated and difficult ones. It has developed special types of limbs for groups of special cases, many of which are

of utmost complexity; it has fitted and helped persons with delicate and tender stumps, also many with stumps of awkward shape and difficult forms; it has applied artificial limbs and appliances to persons with one sound limb as well as to those who have been deprived of both, and the volume of testimony it has on view received from its clients, filled with gratitude, stimulates it to continued endeavors.

The book is destined to be an authority on the important subject of prothesis, a book of interest and concern to the surgeon and physician as well as to the maimed. It contains not only a description of multifarious devices but much general matter both descriptive and critical, and in a way didactic, bearing close relations to the work of the surgeon.

It is a matter of highest gratification and pride that in all the exhibitions in which the firm of A. A. Marks has been represented it has received forty-two first and highest awards, always in competition with others. But the freely proffered expressions of regard and satisfaction from its clients, from the men and women who have been helped and whose lives have been aided and bettered through the use of its apparatus, are more stimulating, and the very highest measure of praise one can hope to receive. Numerous as are those that are printed, they constitute but a fragment of the kind and grateful words that have been uttered in its favor during its career.

The book will reach many readers. To them let us say one word. The firm of A. A. Marks has helped others. It surely can help you.

JAMES LAW, M. D.

NEW YORK, *August* 10, 1905.

CHAPTER I

HOW WE WALK

On Natural Feet.—No two persons walk exactly alike. Everyone carries his mannerisms in his steps. The way in which he lands on his heel, rolls on the sole, lifts on the ball, throws himself to the right or the left, the uniformity and regularity of each joint's action, the angle at which the hip is checked, the range of articulation permitted in the knee and the angular motion of the ankle,—all form a part of his individuality and make it possible to distinguish a friend from a stranger long before his features have come within the reach of vision. All sorts of forces—heredity, early habits, occupation, disease, injuries, and age—influence the movements of the leg and foot. A man in good health walks differently from an invalid, a farmer can be distinguished from a merchant, a bookkeeper from a railroad conductor, the sprightliness of youth, the infirmities of age are reflected in every step that is taken. Yet there are certain facts connected with walking that are common to all and which can be ascertained by observation and study. These facts are so universal that they become laws governing locomotion; they form a necessary part of the limb-maker's education, and unless he is familiar with them and applies them thoughtfully to the construction of artificial limbs, he is not competent to work out the problems that are continually arising.

As this work is designed as a text-book on artificial limbs, it is essential, at the outset, to present the cardinal facts relating to natural walking, in order that the application of them to artificial aids may be clearly understood and appreciated.

Kinetoscopic photography affords the most valuable aid to an investigation of the actions of the knee and ankle joints when performing their functions. It shows that when a man walks slowly, say two miles an hour, the knee flexes but slightly and the ankle considerably. When walking three miles an hour, the knee joint acts through a greater range and the ankle joint through a lesser one. When walking moderately fast, say four miles an hour, the knee action becomes considerable and the ankle action scarcely perceptible. When walking rapidly, say five miles an hour, the knee action is increased and the ankle becomes practically rigid. When running the knee increases its activity, and the ankle reverses its action and throws the man forward by the ball of the foot.

The ratio that exists between the range of motion of the knee and that of the ankle is in proportion to the speed with which one moves. An impulse is had to walk slowly or rapidly, or to change

from one gait to another. The proper muscles and tendons instantly respond to the mind, and the required speed is attained. If the co-operation between the mind and muscles be disrupted the person becomes a paralytic and his steps are unreliable. The same may be said of a person walking on an artificial leg with ankle motion that is not under control.

Three miles an hour is the ordinary gait of a person occupied in

Cut A 1. Cut A 2. Cut A 3. Cut A 4.

commercial life. Successive photographs of a man with natural legs, walking at this gait, show that there is but very little motion in the ankle joint; and limited as that motion is, it is of a character that cannot be imitated by mechanical means. The walker throws his left foot forward, barely touching the heel to the

Cut A 5. Cut A 6. Cut A 7. Cut A 8.

ground, as shown in Cut A 1; instantly the right foot under control of the tendo-Achilles extends and the heel is raised from the ground, throwing the weight of the body on the ball, supplying the impetus that urges the body forward. As the body is carried

forward, the ball of the left foot reaches the ground at about the time the body is vertically over it, as shown in Cut A 2. At this point the right foot is in the act of leaving the ground, and, as shown in Cut A 3, is passing the left which, still being flat on the ground, performs no function, except that of supporting the body, as shown in Cut A 4. The right leg is carried a little further forward when a slight amount of flexion is admitted in the left ankle joint, as shown in Cut A 5. But this is for a very brief period, as Cut A 6 shows that the tendo-Achilles instantly contracts and the foot extends and the entire body is lifted and thrown on the ball, and when the weight of the body is placed on the heel of the right foot, there is a slight flexion in the knee joint which permits the sole to reach the ground. At this time, the knee joint of the left is flexed and the foot of that leg is raised, as shown in Cut A 7, and when the weight of the body is practically over the right foot the knee is extended, so as to support the weight securely, as shown in Cut A 8.

A study of these successive photographs shows that in making a complete step the soles of both feet are not on the ground at the same time, and at times when the weight of the body is placed equally on each foot, the heel of the advanced foot and the toes of the rear foot are only those parts that are on the ground. It also shows that propulsion is obtained by rising on the ball of the rear foot.

On Artificial Feet with Ankle Joints.—Similar photographs of a man walking with one or a pair of artificial legs with ankle joints set to act at a constant range of motion, show that he walks fairly well at a slow gait, but at a speed of three or more miles an hour his step becomes perceptibly awkward, and the effort required to overcome the too liberal motion in the ankle is fatiguing. So far as the knee joint is concerned the motions of the artificial and natural legs are approximately the same, but the motions of the ankles are very different. The sole of the foot is flat on the ground for a considerably longer period with the artificial ankle joint than with the natural. As the walker advances and strikes the heel of the artificial foot on the ground, almost immediately the front of the foot drops and the entire sole rests on the ground and remains there during the interval through which the body is passing over it.

Having made plain the movements of the natural foot in walking, and contrasted them with the movements of the artificial foot articulating at the ankle, we now propose to carry the contrast to the spring-mattress rubber foot attached rigidly to the leg socket.

On Spring-Mattress Rubber Feet without Ankle Joints.—As the walker advances on the rubber foot he touches the heel to the ground. He applies his weight, and the sponge rubber in the heel compresses sufficiently to allow him to roll on the bottom of the foot; the moment the body is carried a little in advance, he rises on the ball very much the same as he does on the natural foot. There is no effort required to lift on the ball, as the weight

of the body, being in advance of its center of gravity, overcomes that apparent obstruction; not a muscle or tendon is brought into play; the weight of the body does the entire work.

These studies and comparisons of the movements in walking bring out very clearly the essential fact that with the artificial ankle joint the interval that the plantar surface rests on the ground is very much greater than that of the natural foot, while with the sponge rubber spring-mattress foot it is approximately the same, and, by compelling the walker to rise on the ball, produces a very natural action, giving greater assistance in walking and dispensing with a vast amount of mechanism.

It is apparent also that the value of mental force in controlling the actions of the natural ankle joint cannot be overestimated. When these forces become inert, as they necessarily do in artificial joints, the embarrassments that follow are the same as with paralytics, locomotor ataxia, etc. The injured are obliged to walk cautiously, the affected foot is placed almost entirely by the sense of sight, and the step is made with meditation and progress must necessarily be slow.

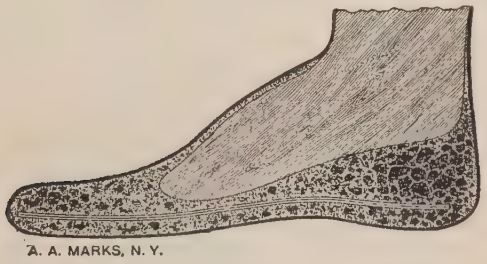
If an artificial leg with ankle articulation be applied to a person who desires to walk at a gait faster than two miles an hour, he will find himself not only greatly hindered, but required to put more energy into the natural foot and leg in order to overcome the influence of the articulating ankle in retarding his progress. The rubber foot without ankle joint will assist rather than hinder rapid walking, and will not hinder slow walking when desired.

CHAPTER II

ARTIFICIAL FEET, THEIR CONSTRUCTION AND RELATIVE MERITS

THE RUBBER FOOT.—With an experience of eight years in manufacturing artificial legs with wood feet, articulating at the toes and ankles, A. A. Marks in 1861 invented the sponge rubber foot hereinafter described, to protect which the United States Government issued letters patent in 1863. Like all great inventions it passed through various stages of development.

The perfected form consists of a wooden core, carved to size and shape to secure the best results. The faint lines in Cut B 1



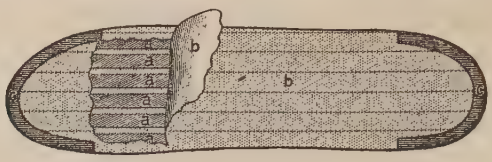
Cut B 1.

represent the core, which reaches to the ball of the foot, localizing the toe movement. The distance from the core to the floor at the heel is considerably greater than at any other part; this is done to obtain the proper degree of compressibility at the heel; the core is entirely surrounded with sponge rubber of great porosity which will yield under the weight of the wearer sufficiently to make the step realistic. Less rubber is placed at the ball so as to provide phalangeal support and make the wearer feel that there is a supporting medium at the front of the foot; ample, to steady him when standing, to keep him from limping, and to act as a lever to urge him forward when walking. A spring mattress is floated in the foot below the core, covering the entire distance from the back of the heel to the tips of the toes; it is shown by the lines running lengthwise in Cut B 1. The spring mattress is formed by a series of composition strips embedded in strong sail duck, each having a pocket of its own, see Cut B 2; the strips occupy the pockets *a a a a*.

THE SPRING MATTRESS.—Is a device for giving additional resiliency for both the toes and heel. Every movement of the foot

when in action applies pressure to the springs at the heel, ball, or on the sides. The counteracting tendency of the strips aids in forcing the foot back to its proper shape as soon as pressure is removed.

Cut B 3 represents the rubber foot with the weight applied at the ball as it is when the wearer is being urged forward, while walk-



Cut B 2.

ing. The spring mattress is now forced upwards at the ball and the sponge rubber is compressed above and below the mattress. This pressure pulls the mattress forward in the foot. These movements—the yielding of the spring, the compressing of the rubber, and the pulling of the spring mattress forward—form a very powerful resultant force that brings the foot back to its normal lines as soon as the foot is relieved of weight.

The condition of the foot when under heel pressure, as it is when the wearer places the artificial limb forward and applies his weight

Cut B 3.

upon it, is somewhat the same. The spring mattress is forced upward, the sponge rubber is compressed above and below, the heel becomes flattened, and the mattress being pulled lengthwise, all combine to force the foot to its shape as soon as pressure on the heel is removed. The compression of the heel permits the toes and the front part of the foot to reach the ground while the shaft of the leg is obliquely back of the vertical line.

Cut B 4 represents the foot on an inclined surface. On account of the yielding quality of the rubber, the up-hill side of the foot

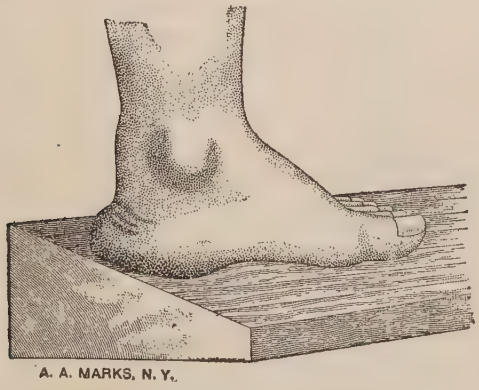
will compress and accommodate itself to the incline and allow the foot to remain on its base. This is accomplished without complicated mechanical lateral articulation.

The spring mattress not only forces the parts of the foot back to their proper shape, but obviates the exertion required to operate the antiquated articulated wooden foot.

The impression that one receives on the new spring-mattress foot is both pleasant and agreeable. This is especially the case to one who has worn an artificial leg with wooden articulating foot.

It can readily be seen that any motion in the ankle that cannot be controlled by the will must be mechanical in appearance as well as in action. The approach to nature is made more positive by their omission.

It is the experienced man, the man who has experimented with many kinds of artificial limbs, who is capable of appreciating the



Cut B 4.

principles involved in the rubber foot. He comprehends the reason why the wearers of artificial limbs with rubber feet walk further, faster, and with less fatigue, than those walking on ankle-jointed wooden feet.

The contrast between the two kinds is most striking in running. With the rubber as with the natural foot the entire plantar surface is never on the ground. It is the heel-and-toe touch to the ground that distinguishes the walker from the runner. This is extremely difficult with the ankle-jointed foot. When standing the immovably attached rubber foot furnishes a large base on which to balance; hence, a man with two artificial legs with immovably attached feet can stand restfully and safely without assuming awkward and unnatural positions, for he is not required to maintain his equilibrium on a point.

The rubber foot with spring mattress provides the laborer a substantial substitute with which to support and brace himself when working at the bench, on the road, on the farm, or at what-

ever occupation he may be engaged. There are no uncertain or treacherous movements to hamper him or make his position uncertain.

A painter who wears a Marks rubber foot says he can climb a ladder, stand on a scaffold, balance himself at any elevation with absolute safety. With an ankle-joint leg he would feel tottlish, and, when on his ladder, would have to depend more on the grasp of his hands than on his foot; but, with the rubber foot, his base is substantial and reliable.

A farmer who toils in the field can plod along over stony or muddy ground on a rubber foot with safety. The accumulation of mud on his shoes does not cause his toe to drop and trip him. Uneven surfaces will not throw him from his balance or violently jar his stump. We have thousands of testimonials on these points.

Contrasts.—There are two kinds of rubber feet. One is known as the sponge rubber foot; and the other as the pneumatic rubber foot. We will endeavor to make clear the difference between them.

When rubber is cured so that it possesses a great number of small air cells, the same as a sponge, it is called sponge rubber, and a foot made in this way is known as a sponge rubber foot.

A foot made of a sheet of rubber cast into the shape of a foot, possessing one or a limited number of large chambers into which air is pumped until sufficient pressure is obtained to maintain shape and possess resiliency is called a pneumatic foot.

The Sponge Rubber Foot.—Is composed of a vast number of cells, each charged with air created by the volatilization of a chemical while the rubber is being vulcanized. Each cell is surrounded by a wall of rubber possessing a sustaining power sufficient to maintain itself should it become deflated. In fact, if all the cells become deflated the foot would keep its shape on account of the presence of the sustaining walls, therefore the shape and resilience of the sponge rubber foot are not dependent upon the air in the cells.

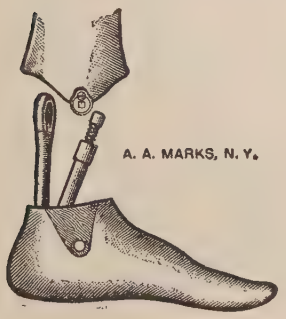
The Pneumatic Foot.—Having but a limited number of large air chambers into which compressed air is forced, is wholly dependent upon the presence and retention of the compressed air for its stability. The sponge rubber spring-mattress foot receives no injury from puncture. The pneumatic foot will collapse and lose its sustaining power the moment the air chamber is penetrated. A protruding nail or peg in a shoe will puncture a pneumatic foot and put it out of service until the puncture is patched and the foot pumped up again with air.

The sponge rubber spring-mattress foot never has to be recharged with air.

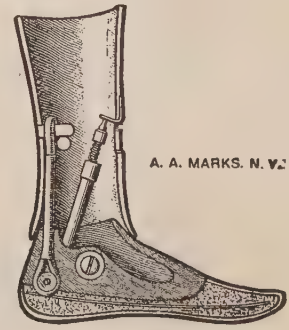
The Wood Foot.—Is now somewhat antiquated. It no longer has the merit it was formerly thought to possess—the rubber foot has practically supplanted it: The wood foot is articulated at the ankle and at the toes. The mechanical methods employed in its manufacture are as numerous as the makers who supply them. Nearly every maker has a method of his own, yet all are essentially

the same. Some admit of a large range of ankle articulation, while others limit it so that there is but very slight motion. Some have side motion; others, equally as conscientious, condemn that motion and employ only front and back motion. Being convinced by most careful study and experimentation that an artificial leg is improved in proportion to the abridgment of its mechanical movements, we dissuade all from using the side motion. Some manufacturers employ rubber for springs in the ankle and toes; others prefer steel. One method has little advantage over the other.

The Ankle-Joint Rubber Foot.—Cut B 5 represents an ankle-jointed rubber foot after our preferred plan. Cut B 6 represents



Cut B 5.



Cut B 6.

the ankle articulation in sectional view. The axis on which the foot moves consists of a bolt that passes through the foot at the ankle, connected with steel strips riveted to the lower sides of the leg. A steel spiral compression spring, one end of which is placed in a cylinder and the other, receiving a piston, is placed in the ankle in such manner as to act on the rear part of the foot, impinging against the front interior part of the socket, forcing the heel downward and the front of the foot upward. The articulation at the ankle is limited by the check cord placed in the rear. It is made of the strongest flexible material. This method of articulation can be used with wooden feet as well as rubber ones. When rubber is used it is not necessary to have a mechanical articulation at the base of the toes as the rubber itself will furnish that motion. Cut B 7 represents the ankle at extension, the foot flat on the ground when the leg is thrown forward and weight applied. Cut B 8 represents the ankle at flexion and weight applied to the toes.

The Felt Foot.—Is so seldom used that it is only referred to here in order to make our descriptions complete. Its use is to be strongly condemned. Felt possesses no stability. It is an absorbent of moisture and lacks resiliency, and is therefore wanting in the most essential qualities that should characterize the material used in the construction of an artificial foot.

Ankle Joints when Ordered.—While many years of observation and study have convinced us that the best results are obtained from artificial legs with rubber feet rigidly attached, it is nevertheless true that some persons form prejudices that cannot be removed even by the most logical arguments. Another class, who may be put in the same group, are those who, for a long period, have worn artificial limbs with articulating ankles; and have become so inured to them that a change, no matter how beneficial it might ultimately prove, would subject them to annoyance. We care not to antagonize those who think and feel this way; we are therefore prepared

Cut B 7.

Cut B 8.

to construct artificial legs for them that are similar in construction to those they have worn and have become accustomed to.

We frequently hear of persons who are inclined to patronize us on account of the reputability of the house, but who hesitate in doing so on account of their doubts as to whether they themselves would make a success with artificial legs without ankle articulations. The idea of the rubber foot is acceptable, but rigidity at the ankle is doubtful. The element of doubt hinders their entering into any experiment the success of which is entirely at their risk.

We are disposed to meet any such person on a basis of equity and will funish him with an artificial leg with rubber foot rigidly attached at the ankle with the understanding that, if after reasonable trial he feels that he would prefer the ankle joint, we will apply one for him without extra charge.

As we regard rubber feet rigidly attached at the ankle better for general purposes, we make limbs that way unless otherwise instructed.

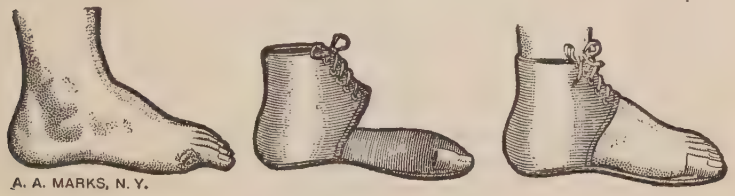
Prices are the same whether rubber feet are permanently attached or made to articulate, whether feet are of wood, metal, or rubber.

CHAPTER III

PARTIAL FEET AMPUTATIONS

Single-Toe Amputations.—The loss of a single toe, particularly if it be the great one, may or may not be the cause of inconvenience and discomfort, yet the application of an artificial part is often found necessary, both as an aid in walking and as a protection to the amputated surface.

If one or more of the interplaced toes are removed and the hiatus has been filled up by the union of the adjacent surfaces, there can be no gain whatever in applying artificial ones. If the great toe (see Cut C 1) or the small toe be removed, and the am-



Cut C 1. Cut C 2. Cut C 3.

putated surface is tender and painful to the touch, an appliance similar to that represented in Cut C 2 can be advantageously applied.

This appliance consists of a duplicate of the removed part, made of suitable material and secured to a plate shaped as the sole of the foot. It is held to the foot by an incasement of leather, laced down the front; when applied it is ready for the shoe, as shown in Cut C 3. This simple arrangement protects the amputated surface, assists in walking, fills the shoe, and prevents unsightly wrinkles in the leather.

Amputations at Base of Toes.—It is necessary to apply an artificial part when all the toes have been removed, as shown in Cut C 4. It must be so constructed that it can be held in place and avoid pressure on the scarred surface. Shoes stuffed with cotton or with pieces of cork should never be used; such expedients, having no support on the under sides, will eventually encroach on the amputated surfaces and permit the shoe to bend near the ends of the stumps.

An appliance illustrated in Cut C 5 is suitable for such an amputation; it is shown applied in Cut C 6. It can be made of wood or metal as may be required, and shaped to receive the foot in a comfortable manner; tender points are protected by recesses pro-

vided for them. Cut C 6 shows this apparatus applied and ready for the shoe. Usually the mate to the shoe worn on the natural foot can be used without alteration; in cases where more room is

Cut C 4.

Cut C 5.

Cut C 6.

needed, almost any shoemaker can supply it by ripping off part of the upper and substituting a larger piece.

Instep Amputations.—These are termed tarso-metatarsal and medio-tarsal by the surgical profession, and are frequently designated by the names of the surgeons who first performed them, as Chopart, Lisfranc, Hays, Hancock, and many others. These amputations are performed with the object of sacrificing as little of the foot as possible, and retaining the heel and a part of the foot as a base on which the patient is supposed to be able to walk or stand. Although a person with the front part of his foot removed may be able to get about with an ordinary shoe, it is not long before he discovers that something is lacking and his locomotion impeded by the absence of the removed part. He may pack the vacancy in his shoe with cotton, cork, or other material, and may re-enforce the sole with a steel plate; but he soon finds that only partial relief has been obtained, and that there is an imperative demand for a substitute for the ball of the foot which will enable him to rise on and elevate his heel from the ground. Something is needed having great strength and that can be firmly secured to the remaining part of foot and leg.

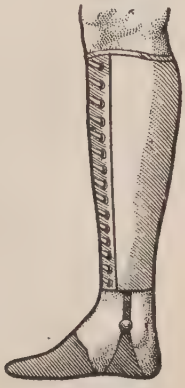
The construction of artificial feet for this class of amputations has taxed the ingenuity of artificial-limb-makers for many years. The absence of space between the bottom of the heel and the floor presented an obstacle to the construction of a helpful and durable appliance until aluminum was employed. It may be useful to review some of the devices used for such cases.

Cut C 7 represents a stump resulting from a partial foot amputation.

Ill-Advised Prothesis.—Cut C 8 represents the way in which many manufacturers have endeavored to supply the want. The appliance consists of a leather shoe inclosing the stump and part of the ankle, the front of which is made of wood, rubber, or cork with a metal plate at the base, running from heel to toe, calculated to make the sole firm and unyielding at the ball. This apparatus gives a natural appearance to the amputated member, but fails to support the wearer in a helpful or substantial way. The stump will soon crowd forward, coming into unpleasant contact with the

appliance; the steel plate will bend or break and the shoe will yield where the stump terminates, creasing the shoe and making it rocker-shaped; consequently it utterly fails in supplying the want, because of the lack of firmness with which it is held to the remaining part; the heel, moreover, will yield to the constantly contracting tendency of the tendo-Achilles and become displaced.

Cut C 9 represents another ill-advised apparatus. It consists of a sheet of metal formed to receive the remaining plantar surface



Cut C 7. Cut C 8. Cut C 9.

of the foot; bent up on either side, hinged at the ankle to steel straps thus providing a joint for ankle articulation; the steel straps run up the sides of the leg and are held in position by a leather corset, shaped to inclose the leg. The front of the metal sole is secured to a part of a foot. The main objection to this device is the insecurity of the attachment; weight applied to the ball of the foot will cause the ankle to flex and permit the amputated surface of the stump to rub against either the front or the bottom plate, causing abrasions; a heel cord placed at the back connecting the leg section with the foot plate will not be effective in holding the appliance in its proper position at all times and checking the action of the ankle articulation at the proper angle.

Objections.—A glance will show that the legs illustrated in Cuts C 8 and C 9 must prove inadequate. When weight is applied to the ball of the foot the heel of the artificial part will remain on the ground, while the heel of the stump will lift away. The wearer will walk flat-footed and will press the delicate cicatrized surface against the attachment. These conditions will not only cause suffering but defeat the object of the artificial foot.

It might appear that an appliance constructed on the plan shown in Cut C 5 could be secured so firmly to the remaining part of a Chopart stump as to enable the wearer to rise on the ball. If this were possible the method of treatment would be greatly simplified; unfortunately, however, the severity of the compression needful

to hold the appliance in place when weight is thrown on the ball, will stop the flow of blood in the heel, causing great pain, endangering the health of the entire leg.

Cut C 10.

Cut C 11.

It is important to emphasize the fact that it is absolutely useless to apply any form of foot to a partial foot stump unless the artificial part is held so firmly that the wearer may rise on the ball of the

Cut C 12.

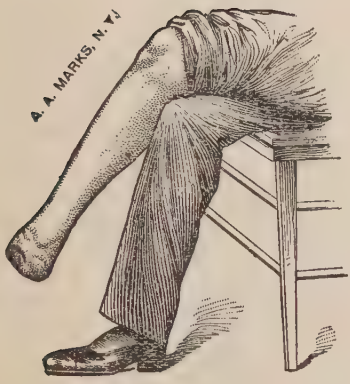
Cut C 13.

foot, and not only support his weight while in that position but carry such additional weight and resist such strains as his habits or occupation demand.

Cut C 10 represents an amputation a little forward of the instep.

The wisdom of the application of apparatus C 5 in this case is doubtful. It might prove adequate in the case of a person who does little walking and no lifting, and who places little demand on the front part of the foot; but for a laboring man, who has to lift and carry articles of weight, it would be a disappointment. It will be better considered, therefore, among instep amputations that require the placing and distribution of the strain above the ankle joint.

Cuts C 11, C 12, C 13, and C 14 show instep amputations after the Lisfranc, Hancock, and Chopart methods. Cut C 15 shows an



Cut C 14.

Cut C 15.

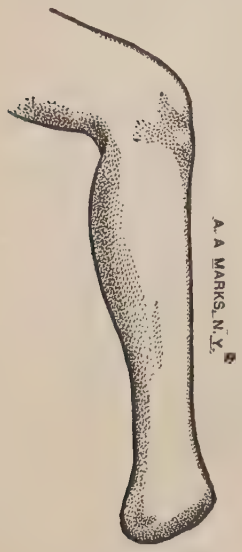
amputation of the instep with all the tarsals removed, a part of the astragalus and the entire os-calcis retained and kept in their normal relations, a very unusual occurrence.

The remaining plantar surfaces of each of these amputations are of a character to permit the application of the weight of the wearer on them.

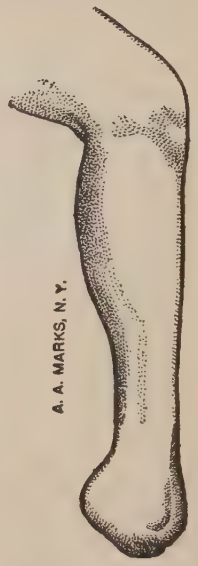
Cuts C 16 and C 17 show instep amputations in which the heels have retracted slightly, but not so much so as to prohibit the application of weight to the remaining plantar surfaces.

Practical Prothesis.—The only artificial limb that has ever been devised that adequately meets the needs of any of the above instep amputations is illustrated in Cut C 18. A half leg, or front, including the core of the foot, is made of aluminum, without articulation at the ankle. The rear half is made of leather, shaped to incase the leg and the aluminum shell and hold the appliance in place, as shown in Cut C 19. The sole of the foot, including the

toes, is made of rubber with a spring mattress as described in Chapter II. Comfortable bearings are provided by proper fittings

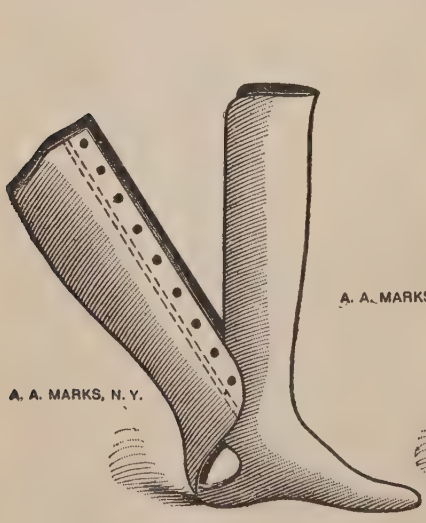


Cut C 16.

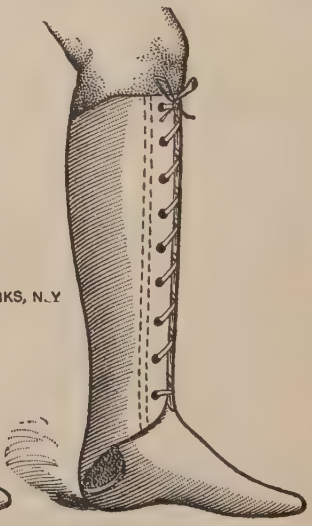


Cut C 17.

and suitable linings. The pressure needed to secure firmness is distributed over the entire leg from the ankle to the knee; with this



Cut C 18.

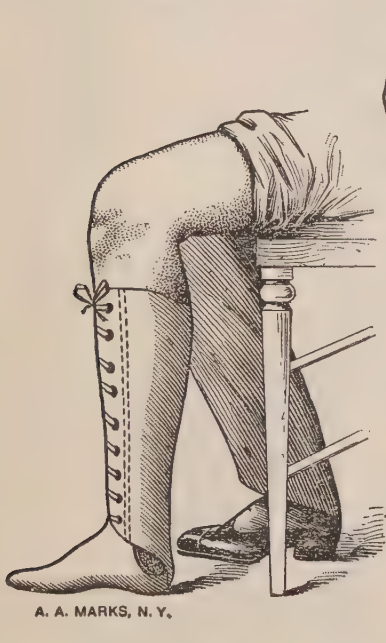


Cut C 19.

leg the wearer can rise on the ball of the foot without endangering the amputated surfaces or straining the ankle joint. The shin-

bone is protected by the aluminum shell on the front, and, when dressed, presents an appearance very close to nature. When there is a tendency for the heel to retract, the leather sheath at the back is re-enforced with metal shaped to hold the heel down to its proper place.

This artificial leg can be worn without inconvenience or pain. The wearer walks gracefully, striking the heel first, then rolling on



Cut C 20.

Cut C 21.

the sole until the ball is reached, and then rising on the ball he receives assistance in walking. Cut C 20 shows the leg applied and the wearer seated. Cut C 21 shows the leg applied with the shoe on and the wearer walking with the weight on the ball of the foot, similar to the position taken by the natural foot when in the act of throwing the body forward.

The method of meeting instep amputations, as just described, possesses many merits aside from those to which attention has been called.

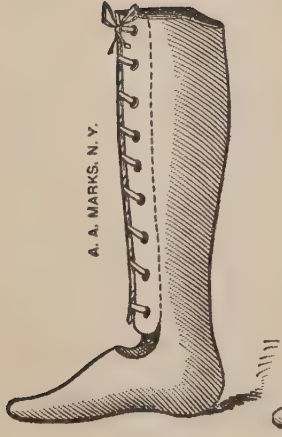
Retracted Heels.—Cuts C 22, C 23, C 24, show amputations in which the heels are retracted so that the amputated surfaces are directly under the legs, where the weight must be applied if the bearings are to be at the ends. These are unfortunate conditions. An artificial leg cannot be applied to a stump under such conditions that will permit any pressure on the scarred extremity; the weight, therefore, must be placed immediately below the knee or about the thigh.

Cut C 22.

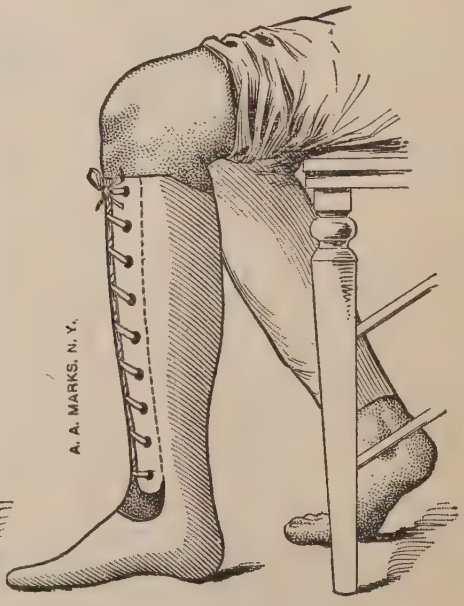
Cut C 23.

Cut C 24.

A limb constructed on the plan shown in Cut C 25 is adaptable for some stumps with retracted heels; the rear half is made of



Cut C 25.

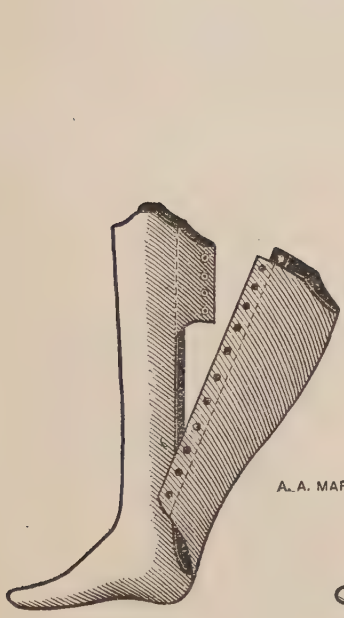


Cut C 26.

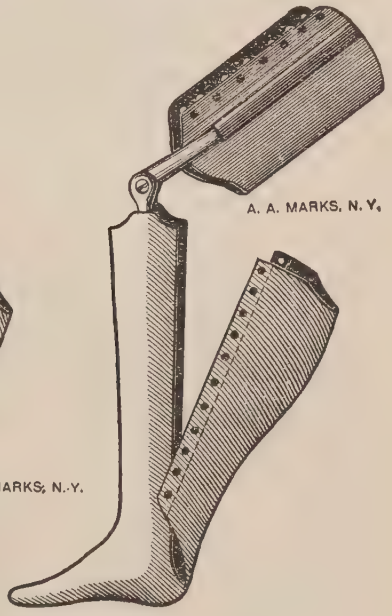
metal, the front of leather, capable of being laced. This permits close fittings about the heel and tends to force it back to its proper

position. If the sides of the leg are sloping, the fitting can be such as to apply all the weight on the leg immediately below the knee. Cut C 26 shows the leg applied and the wearer seated.

If the sides of a leg do not slope sufficiently to prevent settling into the artificial leg socket, it is necessary to introduce an annular top and possibly knee joints and thigh support. The annular top can be applied to a leg constructed as described; it then has the appearance of Cut C 27. It can also be applied to a leg constructed



Cut C 27.



Cut C 28.

on the plan of C 25. Knee joints and thigh support can likewise be applied to a leg constructed on the plan of either C 18 or C 25. Cut C 28 shows such additions applied to C 18 leg. When the annular top is employed the support is calculated to be localized immediately below the knee. The leg is opened from the rear and the stump inserted; the annular top is laced firmly and the leather sheath is pulled over the entire apparatus and laced in front. When the knee joint and thigh support are required, as shown in Cut C 28, the lower section of the leg is made of aluminum, with the rear sheath of leather. The thigh part incases the natural thigh and holds it with sufficient firmness to carry the weight above the knee and so prevent the leg from slipping in the socket.

Aluminum Sockets.—The utilization of aluminum in the construction of artificial legs for instep amputations is especially advantageous. It can be worked to a very slight thickness, thus adding but little to the diameters of the large stump that it

incases. A wood socket would require a thickness of at least half an inch on each side, thus making the leg conspicuously bulky and objectionable.

During the past few years we have made many experiments looking to the general application of aluminum in the construction of artificial limbs for upper amputations, but have met with disappointment except in ankle-joint and partial-foot amputations. The characteristics of aluminum are low specific gravity and comparative strength. Its weight is the least of all metals (one-quarter that of silver). Its strength is comparable with that of copper. It will not corrode when exposed to fresh water or to a moist atmosphere.

We desire to correct the prevalent impression often expressed in the remark that aluminum is "lighter than cork and stronger than steel." As a matter of fact aluminum will sink in water, whereas cork or wood will float; it is therefore heavier and although aluminum is strong, it has but a fractional part of the strength of straight-grained wood. Its use in artificial legs is, therefore, narrowed down to sockets for long and large stumps, where the minimizing of bulk is an important feature.

We hold United States patents on artificial limbs with aluminum sockets, and if we could make satisfactory use of that metal for general purposes we would unhesitatingly do so.

CHAPTER IV

ANKLE-JOINT AMPUTATIONS

Tibio-Tarsal Stumps.—Amputations through the ankle articulations with or without the maleoli, flaps formed of heel tissues, provide stumps that can be fitted with artificial legs in an advantageous way. Surgeons call these amputations tibio-tarsal or Symes, and if the os-calcis is retained and secured at the extremity of the tibia, it is known as Pirogoff's.

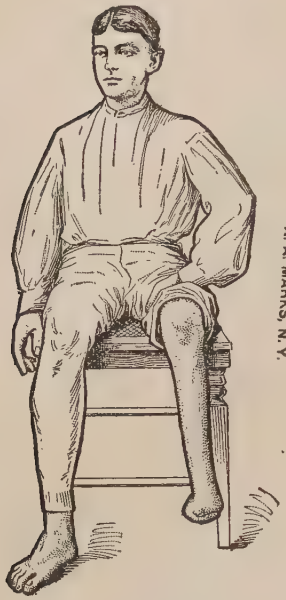
Usually ankle-joint amputations produce stumps that admit of weight being taken on their extremities. If cicatrices are on the

Cut D 1.

Cut D 2.

bearing surfaces or nerve complications are present, they become non-end-bearing and artificial limbs must be applied that permit no pressure or contact on the tender extremities.

End-Bearing.—Cuts D 1 to D 6 show end-bearing tibio-tarsal stumps, with flaps favorable for the application of pressure and with cicatrices well away from the bearing surfaces. Cut D 7 illustrates an artificial leg suitable for any of these types; Cut D 8 shows it applied with the wearer seated. Cut D 9 shows a Pirogoff stump with a suitable leg, patterned after style D 7. Cut D 10 shows the leg applied and the foot covered with stocking and shoe. Cut D 11 shows the wearer fully dressed. In walking his step is



Cut D 3.

Cut D 4.

Cut D 5.

Cut D 6.

graceful, the foot imitates nature, there is no limping, and he is amply equipped to engage in any occupation, even the most laborious.

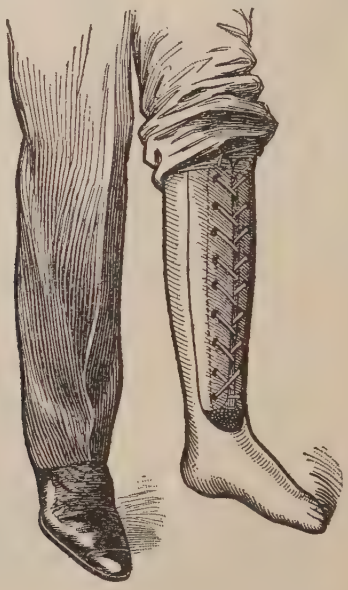
Cut D 7. Cut D 8.

Cut D 9. Cut D 10. Cut D 11.

Construction of Suitable Artificial Leg.—The construction of D 7 style is simple. The front, which is the resisting part, and the core of the foot, are cast in aluminum, the interior surface being

formed to receive the anterior surface of the leg from the knee down. It is so fitted that pressure will be distributed over the front area, the shin bone and tender parts of the leg being protected and not allowed to bear pressure. The rear part is of leather, shaped to fit the calf and the back of the leg. It is secured at its lower end to the aluminum socket, and when the stump is in place it incases the whole apparatus from the knee down, holding the leg in place with firmness, the pressure being regulated by lacing. The foot is of sponge rubber, re-enforced with spring mattress as explained in Chapter II. Weight is taken by the end of

Cut D 12.



Cut D 13.

the stump resting on a surface of proper shape, covered by a suitable pad. The strains resulting from rising on the ball of the foot are not permitted to come on the stump; they are distributed over the leg, about the sides of the shin from the knee to the ankle. A stocking and shoe are drawn over the foot, and the apparatus is a counterpart in appearance to the sound leg.

This style of leg for ankle-joint amputation has received the most complimentary comments; it has given great satisfaction to those who have worn it; and it has been quite generally adopted.

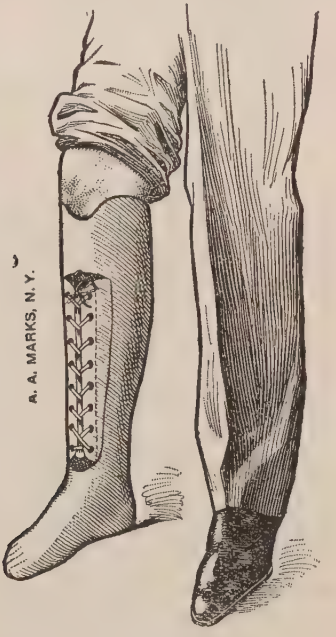
Occasionally conditions require the construction of a limb in a manner reverse to that just described, the stump is admitted from the front instead of the rear. In such cases limbs are built on the plan illustrated in Cut D 12. The construction is practically the same as D 7, except that the metal socket is placed at the back and the leather lace in front. The shin bone is protected by a padded

loose fly-piece over which the lacing passes. Cut D 13 illustrates the leg applied.

If the end of the stump is small and has no prominences on the side, the socket and core of the foot, which are integrally one piece, are carved from a block of wood the grain of which curves on the line of greatest strains. When the end of the stump is large and it is desired to incase it in a socket of minimum thickness, aluminum must be employed for reasons given.

Partially End-Bearing.—If only a part of the weight of the wearer can be borne on the end of the stump the top of the socket must be made annular and fitted so that it will impinge against the sloping part of the leg below the knee. Cuts D 14 and D 16

Cut D 14.

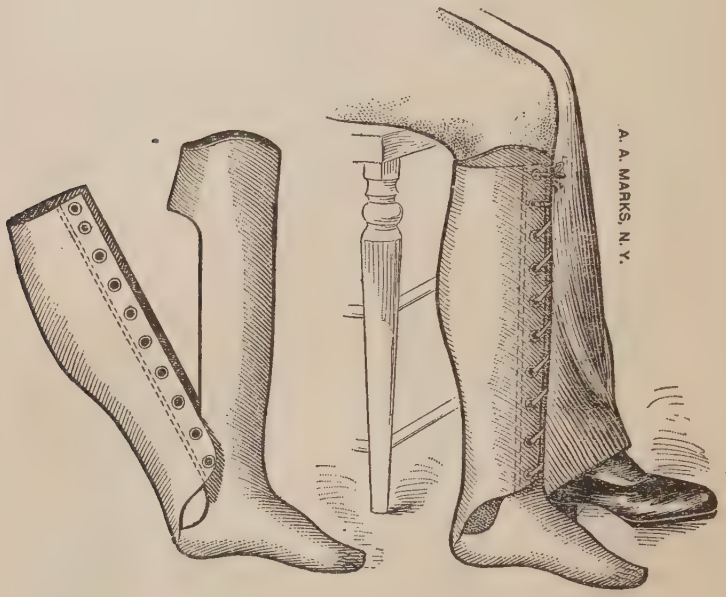


Cut D 15.

illustrate suitable legs for the same and Cuts D 15 and D 17 show them applied. It is obvious that a stump, being inserted from the top of the socket of either, will not enter further than the top of the socket will permit, and this is just far enough to limit pressure on the end or to avoid it altogether. When pressure can be taken on the end, it is regulated by the thickness of the pad placed in the bottom of the socket on which the end of the stump rests.

A socket that admits the stump from the front, as in Cuts D 12 and D 14, is objectionable when the end of the stump is very large. The material necessary for strength is on the sides of the stump and increases the diameter of the ankle. It also affords but little

protection to the sharp or sensitive shin bone. Styles D 7 and D 16 are not open to this objection, but give a smooth, unbroken



Cut D 16. Cut D 17.

front, which can be neatly dressed; they are lighter and stronger than D 12 or D 14, because the strain resulting from rising on the ball of the foot is carried forward from the point of contact to a point on line with the front of the leg: and as this point is usually halfway between the ball and the heel the strain is one-half of that applied in D 12, which throws the strain from the ball to the rear of the heel. For this reason the material on the sides of the stump and on the rear of the leg has to be as thick again as the material on the sides and front of the D 7. Hence the difference in weight.

Sensitive Ends.—There are tibio-tarsal stumps that are so sensitive at the extremities that no pressure whatever can be tolerated either on the ends or at the sides of the ends. Notwithstanding this condition, artificial limbs can be applied that will be helpful and comfortable. Cuts D 18, D 19, and D 20 represent stumps of this character.

If the surfaces immediately below the knee are sufficiently sloping to offer resistance, D 14 or D 16 leg can be used, the pressure being placed on the sides of the upper half of the leg immediately below the knee. The stump from calf down hangs in space.

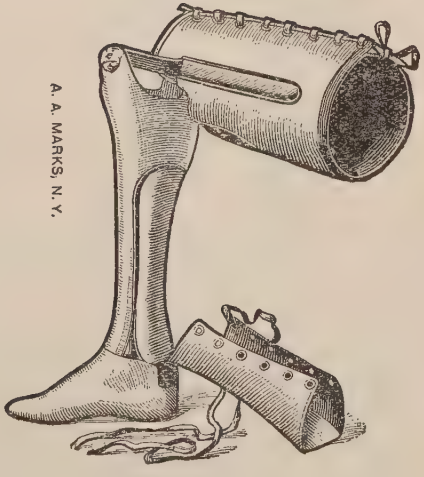
When a leg and stump are nearly uniform in size, the sides being parallel or nearly so, an artificial leg with knee joints and thigh piece must be used. Cut D 21 represents a leg suitable for such a case. Cut D 22 shows the same with knee flexed and sheath un-

Cut D 18.

Cut D 19.

Cut D 20.

Cut D 21.



Cut D 22.

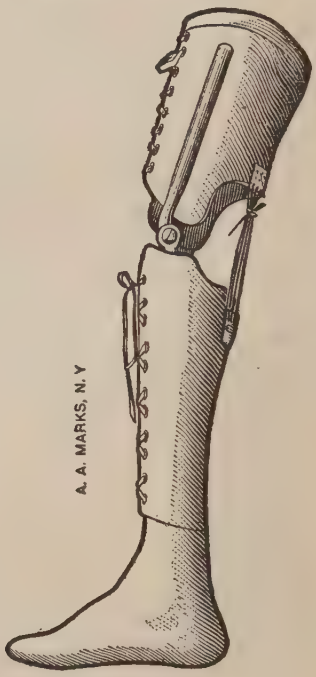
laced. The lower section is made of wood or aluminum, as the conditions of the stump demand. The rubber foot is attached in the usual way, and the leather sheath passes from the rear to the

front, holding the stump in place. The weight of the wearer is supported by side joints connecting the thigh parts with the lower portions.

Cuts D 23 and D 24 illustrate the front and side views of a leg constructed in a similar manner. It is fitted to receive the leg and stump from the front instead of the rear; it contains no important advantage in construction, but is preferred by some persons.

Side joints and thigh supports are essential when stumps cannot

Cut D 23.



Cut D 24.

be supported on the sloping surfaces just below the knees, and when they are liable to become sensitive and irritable on account of impaired vitality.

Peg Legs.—Ankle-joint stumps should never use peg legs except when they need disciplining or shrinking. Some stumps with extremely sensitive ends, on which pressure cannot be immediately applied, give promise of improvement in course of time. There are also stumps that are œdematous—made up with soft, flaccid tissue which will pass away in a brief period. In such cases, an inexpensive peg leg can be used to advantage. One may stump about on a peg leg applied to a stump reaching to the ankle joint, much the same as one who uses a peg leg on an upper amputation, but, having no foot, its functions are extremely limited.

CHAPTER V

BELOW-KNEE AMPUTATIONS

Long Tibial Stumps.—An amputation at any point above the ankle and below the knee produces a tibial stump, so termed by the surgical profession, because the tibia or shin bone has partly been saved.

Enlarged Non-End-Bearing.—Cut E 1 illustrates a stump reaching close to the ankle joint. The extremity, as is usual in long stumps, is poorly protected and incapable of bearing pressure, and,

Cut E 1.

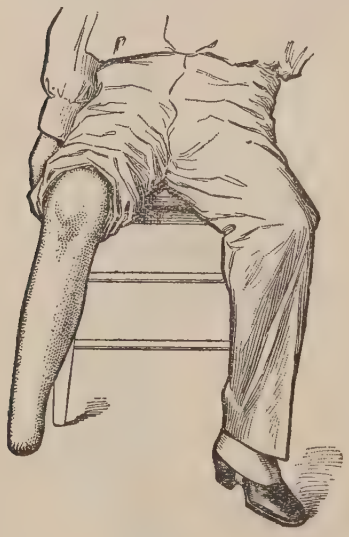
Cut E 2.

on account of a slight enlargment at the end, an artificial leg must be made so that the stump can be placed in the socket from the front or rear instead of being inserted at the top. Cut E 2 represents an artificial leg especially adapted to stumps of this description; it is shown applied and the wearer seated. It has a socket that incases the rear half of the stump, with a front of leather that can be laced. The rubber foot with spring mattress is constructed as described in Chapter II, and at the top of the socket are steel joints connecting the thigh supporter. The fitting of the leg avoids any weight or pressure on the extremity of the stump or near the end, and no pressure is applied at any point below the junction of the middle and lower thirds. Above this it is graduated

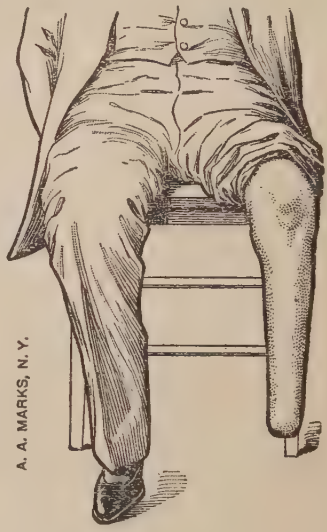
to the knee, where the greatest amount of pressure is applied, the interior sloping surface below the knee carrying most of the weight. The anterior prominences of the shin bone and the exterior prominence of the fibula are given ample room, so that no contact is applied; the interior sloping surfaces below the knee carry most of the weight, the supporter above the knee carrying its share.

No Pressure at the Popliteal Space.—It is most important to avoid pressure at the back of the knee in long stumps. The popliteal space is the vascular area of the leg, and any undue pressure will interfere with the circulation and impoverish or strangulate the end of the stump.

The absence of ankle articulation in a leg for a long tibial stump affords an opportunity to give ample space for the end without



Cut E 3.



Cut E 4.

visibly increasing the external dimensions of the ankle. The rubber foot with spring mattress and yielding heel and toe provides every requisite for easy, lifelike, and noiseless walking without complicated connections. The absence of such connecting parts avoids the necessity of making the leg an inch or two longer than the natural one as is often necessary to obtain space for ankle mechanism used in other systems.

Artificial legs with wooden articulating feet for stumps that reach to any point in the lower third of the leg are impracticable. The ends of long tibial stumps are sensitive, easily irritated, and poorly nourished, and the slightest contact will cause abrasion, frequently necessitating reamputations,.

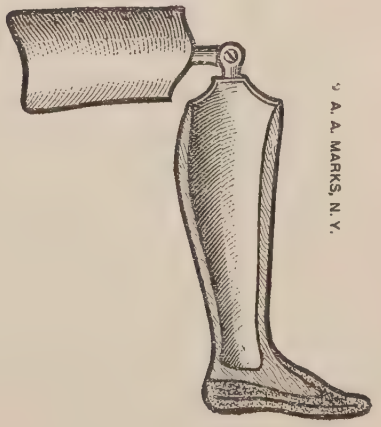
Tapering Stumps.—Cuts E 3, E 4, E 5, and E 6 illustrate long tibial stumps. Legs for such amputations must be constructed so

Cut E 5.

Cut E 6.

there will be ample room for the extremities. In other words, the ends are suspended in space. As these stumps are tapering to the

Cut E 7.



Cut E 8.

ends they can be inserted from the tops of the sockets. The socket is hollowed out near the bottom of the heel and an abundance of

room provided, allowing a wholesome circulation of air; the exterior diameters of the leg are not large enough to be conspicuous. The

Cut E 9.

Cut E 10.

leg socket and foot core are made of a single piece of wood carved from a naturally curved stick, the grain of which follows the lines

Cut E 11.

Cut E 12.

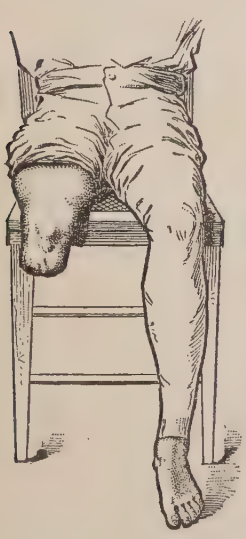
of greatest strains. The rubber foot is attached to the core in a substantial way, and the leg is finished so the exudations from the extremity of the stump will not cause damage to the wood.

Cuts E 7 and E 8 show sectional views of a leg for a long tibial stump as described. The lines in the socket and core represent the

Cut E 13.

Cut E 14.

grains of the wood, which follow the curves of the instep, securing great strength with little material. This method of construction



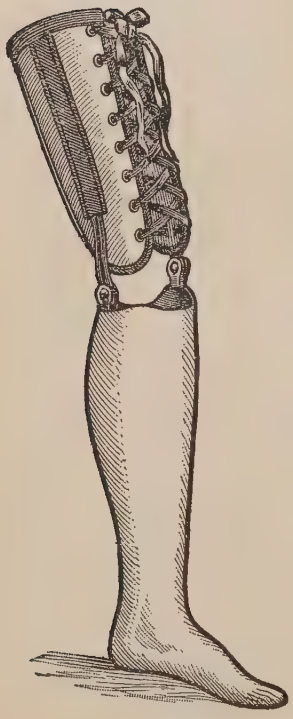
Cut E 15.

Cut E 16.

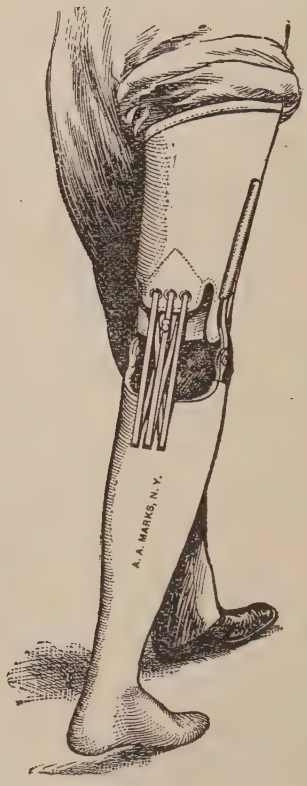
admits of excavating the socket well into the foot so as to provide ample air space. Substantial legs for such stumps cannot be made

with ankle articulations, for cords, springs and bolts require space needed by the stumps. As metal becomes corroded by the exudations of the stumps, wood is the only material which will withstand these destructive agencies.

Ordinary and Short Tibial Stumps.—No difficulties attend the fitting of an artificial leg to a tibial stump reaching to any point



Cut E 17.



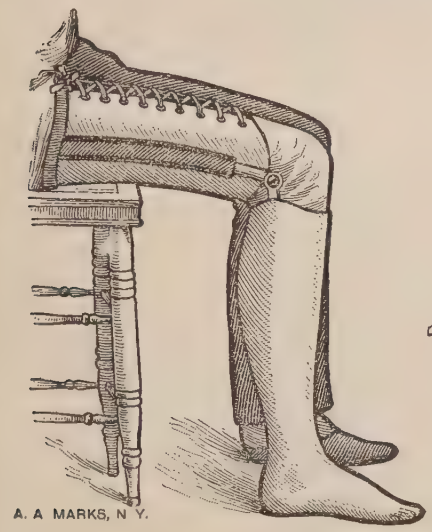
Cut E 18.

between the junction of the middle and lower thirds and the knee, when the knee joint is mobile to not less than two-thirds of the normal range. Cuts E 9 to E 16 are typical below-knee stumps of a variety of lengths and conditions relative to flaps, cicatrices, etc. The location of the cicatrices and the character of the flaps have little importance in non-end-bearing stumps.

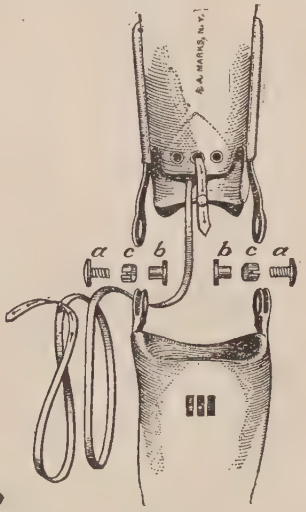
Artificial Leg for Tibial Stump.—A leg suitable for a stump of two inches or more in length, with the knee articulating through a range of 90 degrees or more, is shown in Cut E 17. Cut E 18 shows it applied with the wearer standing. Cut E 19 shows it with the wearer seated. The action of the knee joint is clearly presented.

Construction.—The leg consists of four parts: the foot, the leg, which fills the space between the foot and the knee; the knee joints, and the thigh piece or that part that incases the natural thigh. As the foot has been explained in Chapter II it now remains to describe in detail the other parts.

Socket.—The socket that receives the stump is made from willow or basswood, which is excavated to accommodate the stump. Bearings are permitted at places of toleration. No pressure whatever is put on the vascular parts of the stump or on sensitive or prominent bones. The end of the stump is usually required to hang



Cut E 19.



Cut E 20.

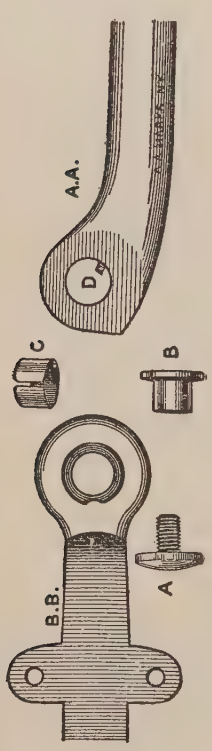
free in space. The exterior of the leg is shaped to as near the natural form as the stump will admit. It is strongly banded and covered with raw hide to obtain strength. The surface is enameled with a waterproof preparation having a soft flesh tint. Knee joints are of the ginglymoid pattern, and as recently improved have very durable wearing surfaces. The thigh piece is made of substantial leather shaped to the contours of the thigh.

Knee Connection.—Cut E 20 represents the upper section of the leg and the lower section of the thigh piece, with the knee joints disconnected at their articulations; *aa* are the screws that hold the bolts *bb* in place; *cc* are the bushings that work on the bolts and receive the wear; a lacing is used to regulate the action of the knee. The mechanical parts of the knee joints are completely illustrated in Cut E 21.

Steel Joints.—Side joints, sometimes called hinge or ginglymoid joints, are used in legs for amputations below the knees. They are more durable and substantial when one of the parts is placed

between the lips of the other and the two connected with bolts and screws.

It is unmechanical and not lasting to place one section of a joint by the side of the other, holding them together by a screw, as is done by some manufacturers. Such joints wear irregularly sidewise and have a wabbling motion after limited service. This would not occur if the lateral strains on the upper sections could be kept the same at all times; but lateral pressure, causing unequal wear at the bearings, is brought about by contracting the thigh by lacing, in order to compress an emaciated thigh or distending it to



Cut E 21.

Cut E 22.

Cut E 23.

accommodate an enlarged one. These difficulties are only avoided by having one of the elements of the joints work between the lips of the other.

The greatest wear on any joint is on the bolt that holds the parts together, and as the attrition is the greatest when the wearer's weight is directly over the knee and becomes less as the knee is flexed, the bolt must necessarily wear irregularly. As the wearing surface on the bolt was formerly limited to the thickness of the section that worked on it, the wear was necessarily very rapid.

The object of the improved joint is to increase the wearing surface as much as possible and to make the wearing parts independent and removable. They can then be highly tempered and the non-wearing parts left untempered, so that the supporting parts will not become friable.

The wearing surfaces are increased more than double. They cover the entire surface of the bolt, and the inferior surfaces of the holes in the lips of the lower part. Cut E 21 shows the mechanism very clearly. AA is the upper part; BB the lower part; C is a long bushing which passes through the two lips of the lower part and the one of the upper; the lug D holds the bushing immovably fixed to the upper part. The bolt B passes through the long bushing and becomes immovably fixed to the lower part by means of a stop pin, which is fastened to the hub of the lower part, and fits a recess made in the head of the bolt. The screw A holds the bolt in place and clamps the joint.

A glance at the section, Cut E 22, will show how these parts work together. Every movement of the joint causes the long bushing to revolve about the surface of the bolt and in the lips of the lower part. This mechanism prevents any wear from taking place on either the upper or lower parts, and distributes what does take place over the entire area of the bolt. The bushing and bolt are made very hard, and can be removed and replaced with new ones at any time that may be desirable. Cut E 23 shows a side view of the entire joints and ready to be attached to the leg.

Test.—A pair of these joints, subjected to a practical test equivalent to that of being worn by a man weighing two hundred pounds, walking an average distance of three miles every day for six consecutive years, failed to develop sufficient wear to cause noise. The joints are made from the most suitable steel, forged from solid material faced and slotted with absolute accuracy, drilled, reamed, and countersunk in templates, the parts being fitted to a nicety and thoroughly tested before being placed on a leg.

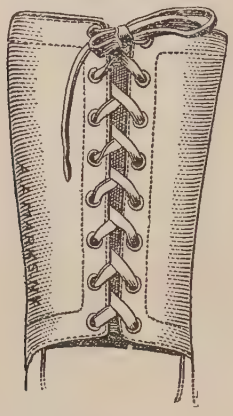
Thigh Part.—The thigh part of the leg is made of durable oak-tanned russet leather, formed to the shape of the thigh, and suitably lined inside. There are several methods by which it is made to compress the thigh; buckles and straps are sometimes used; metallic clamps are occasionally preferred; but the greatest number of limb-wearers find the lacing method the most satisfactory, as it permits uniform adjustments and is neat and durable.

Lacing Methods.—Cut E 24 shows the double-eyelet method. A row of eyelets is placed on each front edge, and a strong buckskin lacing passed through them. This method has been in vogue for many years and is still preferred by many wearers.

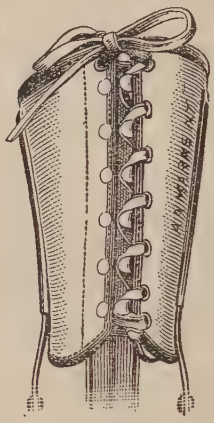
Cut E 25 shows the lacing system more generally used at the present time. A row of hooks is placed on one edge and a row of eyelets on the other. On removing the leg the loops of the lacing are simply slipped off the hooks, the string remaining in the eyelet holes. When the leg is put on, the loops are put over the hooks and the cord is tightly drawn. Some wearers wish hooks on each edge

the same as on shoes. When this is wanted it should be specified in the order.

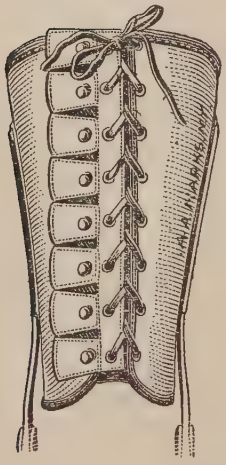
Cut E 26 shows a device for rapid application. A row of studs is placed on one edge of the thigh piece, and a row of eyelets on the other; a separate piece of leather has also a row of eyelets and a



Cut E 24.



Cut E 25.



Cut E 26.

Cut E 27.

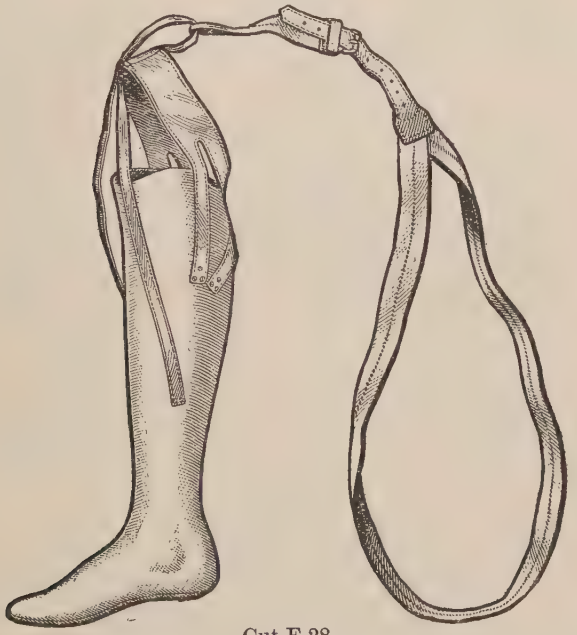
row of studs. This is laced to one side of the thigh piece and buttoned to the other; the lacing can be adjusted once for all. On removing the leg one side is unbuttoned, and the other remains laced, as shown in Cut E 27.

Check Strap.—The lacing at the back of the knee checks the knee action and is regulated by the wearer. It is a very strong leather thong, passing from the thigh piece to the leg part, as in Cut E 20. The more the thong is tightened the less becomes the

motion in the knee, and the more weight will be placed on the ball of the foot and less at the heel.

The stump, in all cases, is inserted into the leg socket; the thigh piece is drawn around the thigh and laced tight enough to hold the leg firmly in place. The stump enters the socket comfortably. Bearings are only admitted about the sloping part immediately below the knee; the anterior surface of the tibia is always accommodated by a channel; the bony prominence of the fibula is provided for by a cavity; and the end of the stump hangs free in space, receiving no pressure whatever, either on the sides or at the end, except when conditions will permit.

Sensitive Stumps.—In cases of extreme sensitiveness the weight can be carried entirely above the knee, and the stump is only



Cut E 28.

permitted to perform the function of moving the lower leg forward and backward.

Non-End-Bearing and End-Bearing.—Weight can rarely be applied to the end of a tibial stump, and only when the end is protected by bone flap or periosteal flap and well covered with muscle tissue. When such favorable conditions exist an end-bearing pad is placed in the socket of the leg, the thickness of which is adjustable, so as to increase or decrease the amount of pressure on the extremity. The wearer, when dressed either with or without the end-bearing pad, is able to walk, run, sit, or lie down. Every posture will have the semblance of nature, every movement will be

made with surprising naturalness. The loss of the natural leg is absolutely concealed, and the substitution by the artificial restores the wearer to his usefulness.

THIGHLESS LEGS.—Artificial legs for tibial stumps are sometimes made without knee joints and thigh pieces, dependence being

Cut E 29.

Cut E 30.

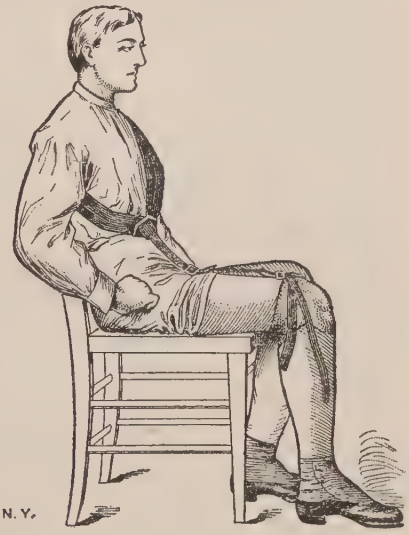
placed upon the socket when supporting the weight of the wearer, and resisting such lateral strains as may occasionally be brought upon the leg. Such a leg is shown in Cut E 28. From the knee down its construction is much the same as leg E 17. The socket is made of wood excavated to receive the stump properly. The foot is of sponge rubber with spring mattress, and the leg is covered with raw hide and finished in flesh-colored enamel. Straps attached to the leg in the region of the calf are made to pass around the thigh immediately above the knee cap. If these do not hold the leg firmly in place auxiliary straps are attached, to pass over one or both shoulders.

Some manufacturers advocate the use of thighless legs whether the stumps are long or short, and pay little attention to the character of the extremities. They attach more importance to the absence of thigh constriction than they do to the danger of abrasions on the stump or injury to the extremity.

While it is true that there are many cases in which thighless legs

are applied and worn with evident satisfaction, it must be clear that the absence of a thigh supporter entails a sacrifice of efficiency and protection. Metal knee joints and thigh supporters perform the very important functions of protecting stumps, avoiding side strains, injuries from concussions, and the tearing of cicatrices. Cut E 29 shows a thighless leg applied, the wearer standing; Cut E 30 the rear view of the same, Cut E 31 the side view, and Cut E

Cut E 31.



Cut E 32.

32 the wearer seated. These cuts show the operations of the leg and the action of the suspenders.

Dangers.—When the wearer is standing with his weight on an artificial leg of the thighless type the stump has to carry all his weight. This usually comes upon the sloping parts immediately below the knee. If the wearer makes a misstep and recovers himself by his artificial leg the stump will receive a strain; if he carries a heavy weight his stump must resist a force that tends to push it further into the socket; and unless the sides of the stump are sufficiently sloping to oppose this there will be danger of injury to the flap and cicatrix.

One of the chief objections to the thighless leg is the difficulty that arises when the stump changes in size, as it so often does. If the stump becomes emaciated the socket of the artificial leg must be filled up to compensate for the loss of flesh, and if the emacia-

tion is not uniform there will be considerable difficulty in padding the inner surfaces of the socket so as to avoid pressure on delicate parts.

One should never experiment with the thighless leg unless the stump has been accustomed to wearing an artificial leg for a considerable length of time, and has become so thoroughly disciplined that further changes are not likely to occur. Those who insist on wearing thighless artificial legs, who have worn them from choice, and who have their stumps sufficiently disciplined will be accommodated in their wishes.

Slip Sockets versus Wood Sockets.—Rival manufacturers have said and published much about the slip or sliding socket and considerable curiosity has been aroused among limb-wearers as to the merits of the idea. As the slip socket applies almost exclusively to artificial legs for tibial stumps, the subject may be introduced and discussed at this time.

We have given the matter much thought and subjected it to a most rigid investigation. We have, moreover, submitted the scheme to many tests and have conferred with several hundred persons who had worn slip sockets. Our investigations were planned to determine whether the scheme had sufficient merit to warrant us in adapting it to our work.

We have long been aware that a well-fitting socket of wood or any smooth hard material will never chafe the stump, even if the stump is permitted to move in it. On the other hand we have known that any socket made of a yielding material like leather will, from the constant pressure and heat of the stump, change in form and cease to be comfortable. Perspiration and other exudations from the stump have deteriorating effect on any material that permits absorption. All exudations from the stump becomes putrid in a very short time and cause offensive odors and bring effete matter in contact with the skin. This almost invariably infects the stump and causes unhealthy conditions. A hard highly polished surface is more pleasant for the stump than any form of soft yielding cushions.

The slip-socket idea is somewhat antiquated. In 1866 the United States Patent Office issued letters patent No. 55,645 to Daniel Gilson, covering the principle of the slip socket, consisting of a leather socket molded on a cast of the stump, then placed inside the artificial leg, and held in place by springs. Its object was to obviate the movement of the stump in the socket and to localize all the motion between the stump socket and the socket of the artificial leg. It was very soon found that the stump socket, being tightly held to the stump at all times, constricted the blood vessels and caused much trouble. The inventor, being conscientious, abandoned the manufacture of legs on that plan.

Quite recently, however, the slip-socket feature has been revived, and some insignificant modifications made on the original Gilson model, mainly in the mode of suspending the inner or slip socket. The idea has been extensively advertised and a considerable num-

ber put in use. We have records of many of these cases, and we feel it a duty to the maimed community to disclose the effects a slip socket has had on many stumps.

It must be remembered that in order to carry out the principle of the slip or sliding socket the stump must remain under constant pressure, great enough to avoid any motion or friction between the stump and the socket. All the slipping and sliding due to the intermittent application of weight, as in walking, takes place between the slip socket and the socket of the artificial leg. Few stumps can tolerate this constant pressure without the blood vessels becoming strangulated; we therefore do all we can to dissuade clients from risking such a dangerous experiment.

Slipping of the Stump Desirable.—There is nothing so pleasant to a wearer of an artificial limb, no matter what kind of a leg he is wearing, as to be able to lift his stump from its bearings and give it a chance to rest and recover, exactly as one does when standing on natural legs. He throws his weight on one leg for a while and then on the other, and in this way both legs in their turn become rested. Every wearer of a wood-socket limb invariably does this. It is a source of comfort and relief; but it cannot be done with the slip socket, which clings to the stump like a leech.

The socket that is made to fit the stump so that pressure will be uniformly distributed over all its parts, is neither scientific nor tolerable. Every stump has parts that will bear pressure and parts that will not stand any at all. Parts where blood vessels and nerves are clustered, where the bones are close to the surface and poorly protected by tissue, must be prevented from impact. A flexible socket has a tendency to assume the shape of the stump and distribute the pressure uniformly, bringing as much on the forbidden parts as elsewhere. Therefore the flexible socket is a dangerous one to wear.

A socket that fits properly will never chafe the stump, no matter how much it may slip, slide, or move in it. This is a fact ascertained by most careful, thoughtful, and conscientious investigation, and cannot be successfully controverted. We know from very ample experience and inquiry that there is no socket so pleasant to wear, so light, so cool, and so healthful for the stump as the wooden one, when properly and scientifically fitted. No material has ever given such permanently good results as wood.

An Instance.—Mr. Frank M. Talbot met with a railroad accident in 1890 which crushed his leg. Amputation was made below the knee, leaving a stump four inches in length. He obtained an artificial leg with wooden socket, which he wore for some time with efficiency. His stump, following the usual course, emaciated, and instead of having the leg refitted he was prevailed upon to order a new leg with a slip socket. He wore the leg for a while, but gradually the end of his stump became congested and painful. He went to his slip-socket leg-maker for relief, but was told that his stump was diseased and nothing but medical or surgical treatment would help him. The stump grew worse; he called in a

physician, who by medication brought it to a healthy condition, but put him on his back for a while. Shortly after he resumed wearing the slip-socket leg, the trouble recurred. He came to New York, and under the impression that his stump was diseased, consulted several prominent surgeons. All agreed that the stump had been strangulated by the artificial leg, and unless the cause was removed the bone would soon become infected and re-amputation would be necessary.

Mr. Talbot called upon us, and on examination we found the end of the stump swollen and as blue as indigo. An abscess was forming. We told him that his trouble was due to pressure upon the blood vessels, and advised him to abandon the slip socket, and wear a wooden one, so fitted that it would not constrict the blood vessels nor permit any of the tender parts of the stump to take pressure. He yielded to our advice, and we made and applied a leg with wooden socket and our patent rubber foot. It was remarkable how quickly his stump recovered. As soon as the pressure was removed from the vascular parts, circulation was restored and the stump became healthy. This was eleven years ago and the stump at this writing is in a healthy condition, without the slightest indication of a recurrence of his trouble. We can cite hundreds of cases similar to this and will gladly furnish additional data to those desirous of investigating further.

Waterproof Legs.—There are some occupations that require limb-wearers to stand in damp and wet places, exposing their artificial legs to moisture, much to their injury.

Our method of constructing artificial legs with rubber feet, non-articulating at the ankle, enables us to meet every requirement of such cases. The leg and ankle is of natural curved timber, with the grains running on lines of the greatest strains. The foot is of sponge rubber with spring mattress, and the whole is covered with suitable material, coated with a waterproof preparation.

Bridge-builders, oysterman, fishermen, woodsmen, raftsmen, trappers, and hunters find the waterproof style of leg especially adapted to their wants.

Bathing Legs.—Persons who indulge in aquatic sports can use artificial legs of this kind; with them they can wade, bathe, or swim in salt or fresh water exactly as persons in possession of their natural limbs and without disclosing the fact that their limbs are other than those provided by nature. Cut E 7 is a sectional view on which waterproof legs are constructed. It will be seen that there are no parts, connected by glue, metal, or rivets that can be affected by moisture. The entire lower leg is of one piece, capable of withstanding the severest strains and exposures. The natural-crook feature is covered by letters patent.

Shortened Thigh.—Complicated conditions in tibial amputations frequently present themselves and require specially designed artificial limbs. Cut E 33 illustrates a case in point. The injury to the patient, necessitating the amputation of the leg below the

knee, fractured the thigh and dislocated the hip. The femur became lapped and deflected and its head was permanently displaced. This occasioned a shortening of the thigh of several inches. In the artificial leg the shortening of the thigh was com-

Cut E 33.

Cut E 34.

pensated for by lengthening below the knee. A leg constructed on the plan of E 17 is suitable for cases of this character. Its thigh piece is made to extend well up to the body and take in the gluteal folds and the entire external surface as far as the crest of the ilium, thus giving the necessary support to the fractured part.

Cut E 34 illustrates a case of shortened thigh of the left leg while the right was amputated. It resulted from a railroad accident which crushed the right foot and ankle and fractured the opposite thigh. The right foot was amputated at the junction of the lower and middle thirds. Despite every effort to bring about the correct union of the fractured femur of the left leg, the bones slipped, resulting in a shortening of the thigh by several inches. An artificial leg constructed on the plan of E 17 was applied. The leg from the knee down was as much shorter than the left as the thigh of the left was shorter than the right.

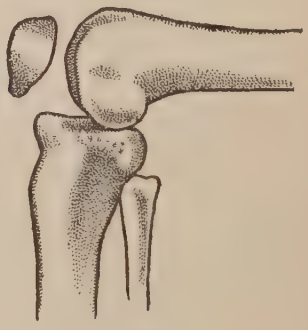
In both these cases the artificial legs necessarily caused a disparity in the lengths of the legs from the knees down, but the differences were not noticeable, even when the wearers were seated,

except when closely scrutinized. In other respects there were no inconveniences experienced.

In ordering an artificial leg every peculiarity of the sound leg as well as the partly amputated one should be brought to the attention of the manufacturer. If there is a shortening in either the upper or lower sections of either leg, the manufacturer must be fully informed, so as to be able to construct the artificial leg to meet such conditions.

Eccentric Knee Joint.—Occasionally there are circumstances that make it difficult to obtain neat and smooth adjustments of an artificial leg about the knee of a tibial stump. When the leg is made to adjust smoothly while the stump is at full extension, there appears to be a shrinking away of the stump from the socket when flexed. This not only limits the range of knee motion but produces cramping and pinching of the tissues back of the knee. This condition can usually be traced to some peculiarity in the anatomical construction of one or both of the knee-articulating surfaces. Cut E 35 represents the bones of the natural knee joint

Cut E 35.

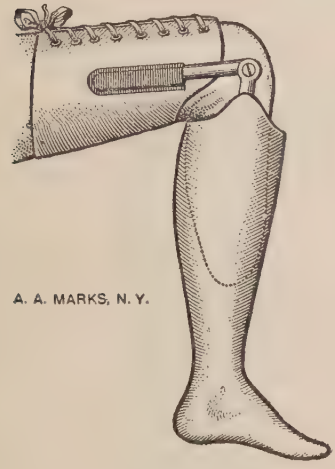


Cut E 36.

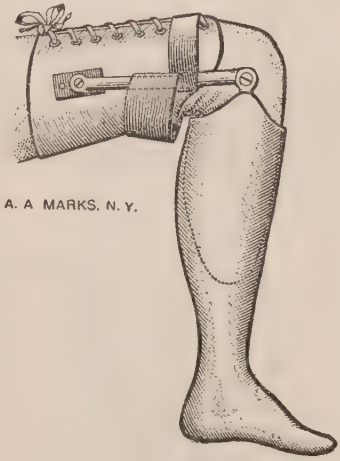
at extension; Cut E 36 represents the same at flexion. It will be observed that in passing from one to the other the base of the femur is required to travel over the bearing surface of the tibia. The curvature of the articulating surface of the femur is neither elliptical, parabolic, nor follows any geometric curve. The bearing surface of the tibia should be flat. Sometimes it is slightly curved. When two surfaces roll upon each other there is no point that can be located as the center of motion. The nearer the articulating surfaces of the tibia approach a plane, and the nearer the articulating surfaces of the femur approach an arc of a circle, the more uniform will be the motion of the knee. When the articulating surfaces of the knee of an amputated leg depart from these conditions a modification in the mechanism of the artificial knee joint

is required, in order to make the artificial leg articulate more in harmony with the natural knee. The duplex knee joint, which admits of flexion and extension in polycentric curves, has been designed to meet this condition.

Duplex Knee Joints.—Cut E 37 represents the conventional type of artificial leg for a tibial stump regardless of eccentricity of



Cut E 37.



Cut E 38.

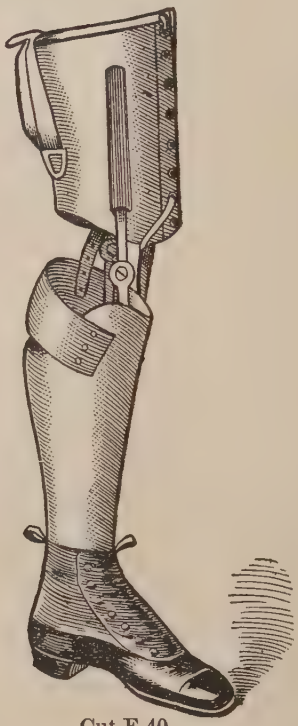
the knee motion. The cut shows how the stump, when flexed, is pulled away from the front of the socket, and how the tissues are folded under the knee and pinched, a condition due entirely to the efforts of forcing an eccentric knee to act with a concentric joint. Cut E 38 illustrates the E 17 leg with duplex joints applied to a stump with eccentric knee. The effect, as can be seen, is that the stump is held in its proper place, greater power of genuflection is obtained, the cramping at the back of the knee is obviated, and the stump is caused to remain close to the socket in front; the tibia is pointed directly downward, instead of downward and forward, and is prevented from impinging against the interior-anterior surface of the socket.

The duplex joint has two centers, one well up on the thigh and the other close to the knee; an independent strap connects the two side bars at the rear; an elastic band connected with both side bars passes over the front of the thigh. These straps give firmness to the adjustments, and at the same time admit of sufficient oscillation to permit the stump to remain in its bearings.

Contracted Knee Joints.—Another class of leg stumps are those which are sufficiently long to control the knee movements of the artificial leg, but being partly contracted, the extension of the knee is somewhat limited, so that the use of the ordinary type of E 17 leg is impossible, while the contraction is not sufficient to make the knee joint inoperative in controlling the artificial leg.

Knee joints of tibial stumps become contracted either from the results of the injuries that occasioned their amputation, or, more frequently, from neglect in permitting the stumps to remain in semi-flexed positions during the convalescent periods. Cut E 39

Cut E 39.



Cut E 40.

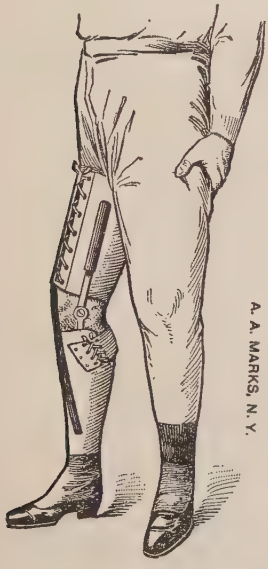
illustrates a partially contracted knee of a tibial stump which is capable of full flexion but of limited extension.

An artificial leg on the plan of E 17 with a slight modification of the socket, as shown in Cut E 40, meets the requirements of the case. By referring to Cut E 41 it will be seen that the stump is received in the socket while in a semi-flexed position. The socket is so made as to bring constant and gentle pressure upon the hamstrings every time a step is taken. The object of this is to induce the breaking up of the contraction and eventually restore full knee motion. The artificial leg is provided with a lacing attachment that passes over the rear part of the stump. As the stump improves in extension this lacing strap is tightened and greater pressure brought upon the stump.

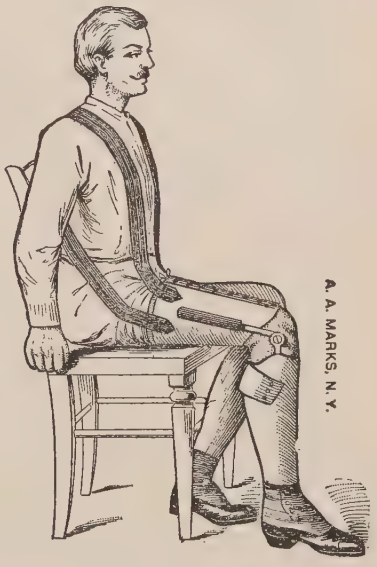
Although a stump may be contracted to a considerable angle a leg of this character can be worn and the wearer enabled to get about in an advantageous way, concealing his loss, walking in a graceful manner, and dispensing with the use of crutches.

We know of no more practical method for breaking up the contraction in the hamstrings than wearing an artificial leg of this type. The wearer is permitted to engage in his usual occupations while the work of restoration of the knee motion progresses. When the knee has become corrected and the stump can be extended to a straight line, the socket on the artificial leg can be removed and the regular socket, similar to that shown in Cut E 17, applied at a very slight expense.

Cut E 41 shows the leg applied to a contracted stump and the wearer walking. Cut E 42 shows it with the wearer seated. The



Cut E 41.



Cut E 42.

contraction of the hamstrings does not interfere with walking, standing, or sitting.

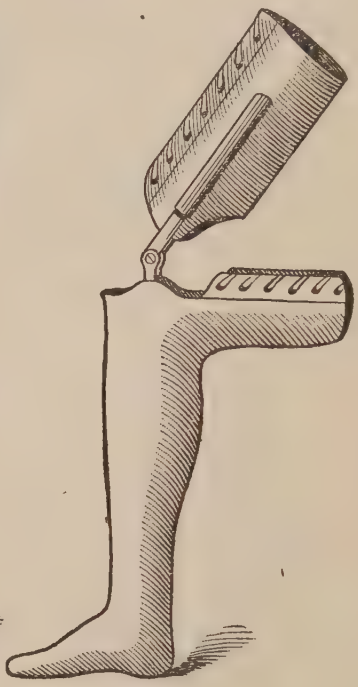
Cut E 43 illustrates a tibial stump with a contraction of the hamstrings considerably greater than in the last case, so great as to prevent the knee from extending beyond a right angle with the thigh. Cut E 44 represents an artificial leg suitable for this case.

A knee-bearing leg might be considered the more suitable, but when the fact is remembered that there is an angular motion in the knee, with the possibility of improvement, it is better to apply a leg that will keep up the action of the knee and bring a constantly increasing tension on the hamstrings. A leg constructed

on the plan of that represented in Cut E 44 is made for this purpose.

Hypertrophied Tibial Stump.—Amputations through the tibia are sometimes necessitated by hypertrophy, with induration of the foot and ankle, as in the case of elephantiasis. Such cases usually

Cut E 43.



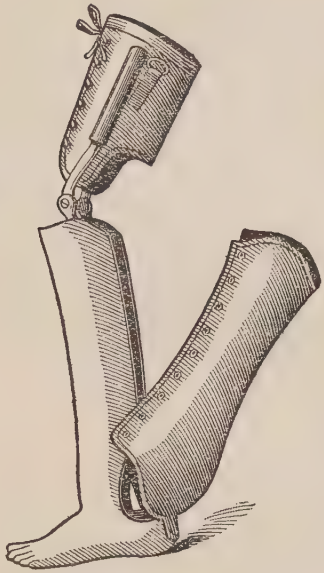
Cut E 44.

produce stumps that are much larger at their extremities than above, the extremities incapable of bearing pressure, and the sides able to tolerate only limited compression. Cut E 45 shows a stump of this character. It requires an artificial leg constructed upon the plan of E 46, with the rear open so as to receive the stump, the stump and socket are incased by a sheath holding the parts together. Cut E 46 represents a side view of an artificial leg suitable for such cases. Cut E 47 presents the front view with leg applied.

In all the complicated cases previously described, the method of constructing artificial legs with rubber feet and spring mattress is especially advantageous. Great strength is obtained, durability is secured with minimum weight and bulk about the enlarged extremity.

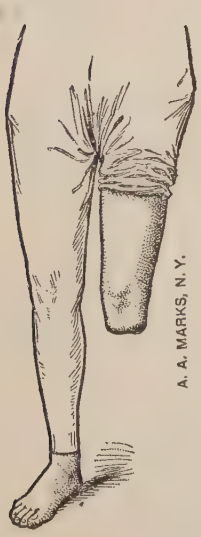
Anchylosed Knee Tibial Stumps Extended.—Some tibial stumps are rigid when extended. That is, they cannot be flexed, owing to anchylosis of the knees resulting from the injuries that

Cut E 45.

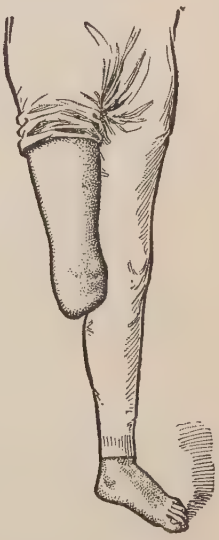


Cut E 46.

Cut E 47.



Cut E 48.

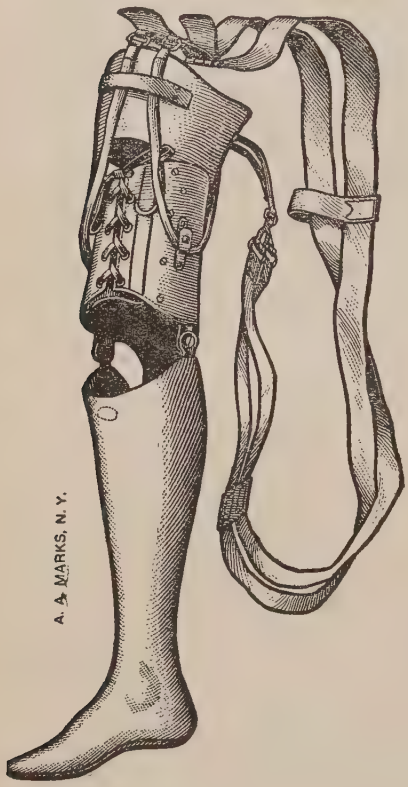


Cut E 49.

caused the amputations, impairment of the knee tendons, calcareous deposits in the articulations, and many other causes. If there is an absence of mobility in the knee and the stump is extended, an

artificial leg must be constructed so that the artificial knee articulation will be independent of the natural knee and operate on the sides of the stump approximately at the points where the natural articulation takes place. Cuts E 48 and E 49 represent tibial stumps extended, with knee joints anchylosed.

It will be observed that in Cut E 48 the sides of the stump and thigh are approximately parallel, or in other words they do not slope sufficiently to offer any sustaining surfaces. An artificial leg



Cut E 50.

Cut E 51.

constructed on the plan of Cut E 50 is intended for a stump of this character.

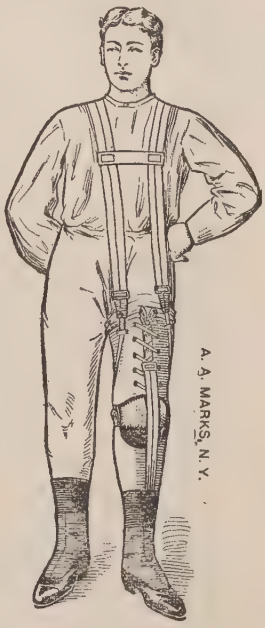
The top part of the thigh piece is annular and permits the stump and thigh to enter until the gluteal folds, the ischium, and the perineum come in contact with the top border of the socket, where the entire weight is applied, the same as if the amputation had been made in the middle of the thigh. Cut E 49 represents a stump the sides of which are tapering sufficiently to offer some opposition, sustaining in part the weight and lessening the amount

of pressure on the top border of the socket. An artificial leg constructed on the plan of E 51 will meet the requirements of this case. Both of the above artificial legs are made to articulate at the knees.

The legs from the knees down are constructed practically the same as the E 17. The thigh piece is leather and wood; the rear of wood and the front of leather arranged for lacing, so that the required pressure will be brought upon the thigh to hold it in place. Leg E 50 differs from E 51 in the top of the socket, it being annular with continuous border. It is held securely to the body by the lacing front, assisted by suspenders passing over the shoulders.

The knee joints of these legs are of the hinge style as illustrated in Cut E 21. Articulation at the knee is limited by a check cord

Cut E 52.



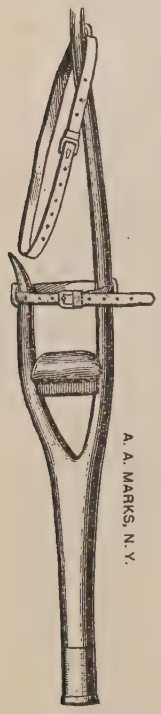
Cut E 53.

connecting the thigh and calf sections. Cut E 52 shows the leg applied, the wearer seated; and Cut E 53 shows it with the wearer standing. It will be seen that the knee articulation approximates very closely the action of the opposite leg and permits the wearer to stand, walk, sit, or kneel.

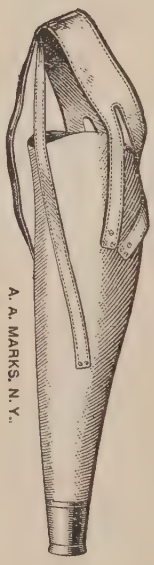
Peg Legs.—Peg legs suitable for tibial stumps are of three kinds. The simplest and least expensive is shown in Cut E 54. It consists of two wooden branches, one running up on the outside of the thigh, well up on the body, the other on the inner side reaching nearly to the crotch.

These branches unite below the point of bearing and continue to the ground, terminating in a rubber tip. A padded shelf is placed between the branches on which the knee rests when in a flexed position. The leg is held in place by leather straps passing around the thigh and body.

Cut E 55 shows a peg leg without knee joint or thigh support suitable for a tibial stump. The socket is shaped to receive the



Cut E 54.



Cut E 55.

Cut E 56.

stump from the knee down in a comfortable way. The base terminates with a rubber tip, and straps necessary to hold the socket on the leg are connected with the leg and passed around the thigh immediately above the knee cap. When necessary, suspenders are attached to help carry the weight.

Cut E 56 shows a peg leg suitable for a tibial stump constructed practically as E 17, except that there is no rubber foot, a rubber tip taking its place.

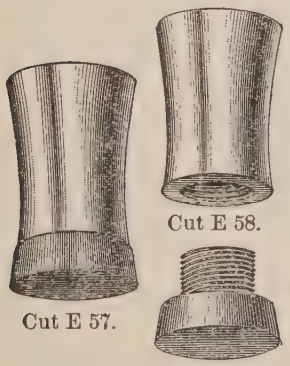
Peg Legs Should Not be Used Permanently.—Peg legs are worn as temporary expedients, for disciplining stumps, or to bridge over an impecunious period. We know persons, however, of ample means who have reached advanced years, who from childhood have

constantly worn peg legs, and doubtless will continue to do so, as long as they live.

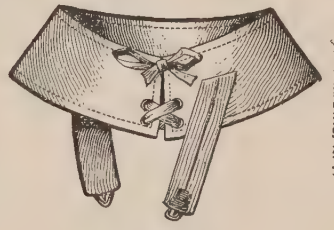
It is quite possible to stump around on peg legs and do much hard work with them. They are immeasurably better than crutches, but they are very far from rendering the services that can be obtained from artificial legs with sponge rubber feet. The foot is an essential factor in helpful easy walking, and a means of opposing strains required in carrying heavy weights, ascending or descending stairs or elevations, and in walking long distances.

We disparage the use of peg legs, as we are keenly alive to the fact that they are inadequate to meet the demands that must be put upon them. Any form of peg leg that will keep the knee joint in a flexed position is liable to weaken the tendons of the knee, impair the knee movement, and limit its range of motion. They should, therefore, be used only as expedients.

Ferrules for Peg Legs.—Cut E 57 represents an aluminum peg-leg ferrule and rubber tip. Cut E 58 represents the aluminum ferrule separate, and Cut E 59 represents a pure gum rubber tip



Cut E 57. Cut E 58. Cut E 59.



Cut E 61.

separate, which screws into the ferrule. Cuts represent one-quarter size. The ferrule is permanently fastened to the peg leg, and the rubber tip screws into it.

Rubber Tip.—When the rubber tip wears down so that the metal ferrule touches the ground, it should be removed and a new one put in. The base of the rubber tip is 2 1-2 inches in diameter and the threaded shank is 1 1-2 inches in diameter.

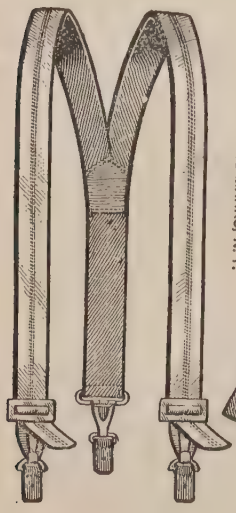
Suspenders.—Suspenders for artificial legs for tibial stumps are of many kinds. Most persons with long and healthy stumps do not use suspenders at all, and a very small number retain them after they have become accustomed to their artificial legs.

As an aid for the beginner, however, we deem it advisable to put suspenders on every leg made for tibial amputation, whether the stump is long or short.

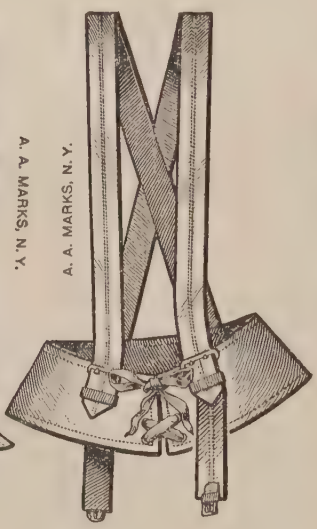
Cut E 60 shows a double suspender for a tibial stump leg. It

consists of two-inch elastic webbing connected with the back of the thigh piece and running well up to the shoulder, where two non-elastic straps, each 1 1-2 inches wide, are attached which branch so as to pass over the shoulder. They are connected with the upper part of the thigh piece in front, and adjusted by clamp buckles with snaps.

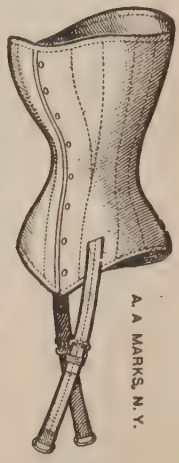
Cut E 61 presents a simple yoke suspender preferred by women. It is made to fit the body immediately above and upon the hips.



Cut E 60.



Cut E 62.



Cut E 63.

It is seldom necessary to use shoulder straps. Straps running down from the belt connected with the upper part of the thigh piece are usually ample.

Cut E 62 shows a yoke suspender similar to the last, but provided with shoulder straps. Elastic straps buckled into the attachments connected with the thigh piece are used to fasten the yoke to the leg. This method is necessary for small hips and in cases where entire support from the hips or pressure about the loins or over the abdomen cannot be tolerated.

The corset style is frequently preferred by women. It consists of strong elastic straps secured to the lower part of the corset, one in front and one at the back as shown in Cut E 63; they are buckled into straps secured to the upper part of the thigh piece.

CHAPTER VI

KNEE-BEARING STUMPS

Definition.—When the knee joints of tibial stumps are contracted at right angles, or when the stumps are so short that they are unable to control the artificial knee joint, they are termed knee-bearing stumps, and require artificial legs constructed to receive them in flexed positions.

It is sometimes problematical to determine whether a stump should be placed in this class or in the class requiring legs constructed on the plan of E 17. The conditions to be considered in deciding the question are as follows: First, anchylosis or immobility of the knee joint when flexed. Second, length of the stump projecting back of the thigh when at right angles. If this is less than two inches the knee-bearing leg must be selected. Third, remediless contraction of the flexors, limiting the angular

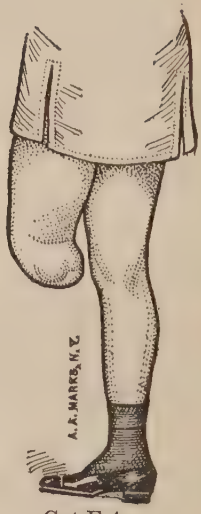
Cut F 1.

Cut F 2.

range of motion to one-half the normal range, no matter how long the stump may be. Cuts F 1 to F 4 show typical knee-bearing stumps.

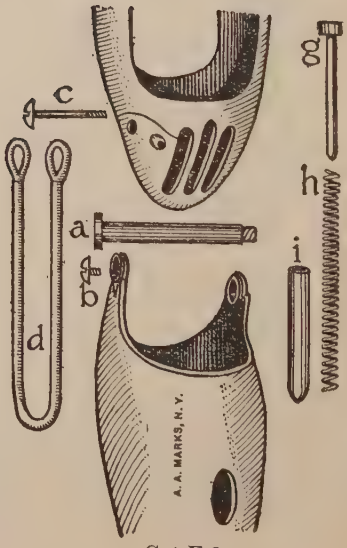
Knee-bearing Legs.—Cut F 5 shows a leg suitable for stumps of above character. The socket and leg part are made of wood covered with rawhide and enameled. The socket is excavated to receive the stump and thigh in a comfortable way, and the

Cut F 3.



Cut F 4.

Cut F 5.

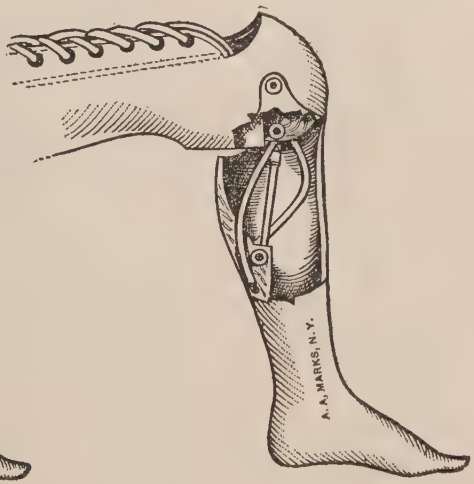


Cut F 6.

part from the knee down is hollowed out to reduce the weight. The exterior dimensions are as close to those of the natural leg as conditions will admit. The foot is of rubber with spring mattress as previously described.

Bolt Joint.—Cut F 6 shows the knee mechanism with the parts separated: *a* is the knee-bolt which holds the leg and thigh sections together, forming an axis for the knee. It is flanged on

Cut F 7.

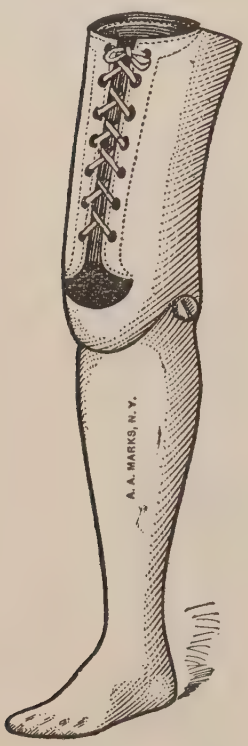


Cut F 8.

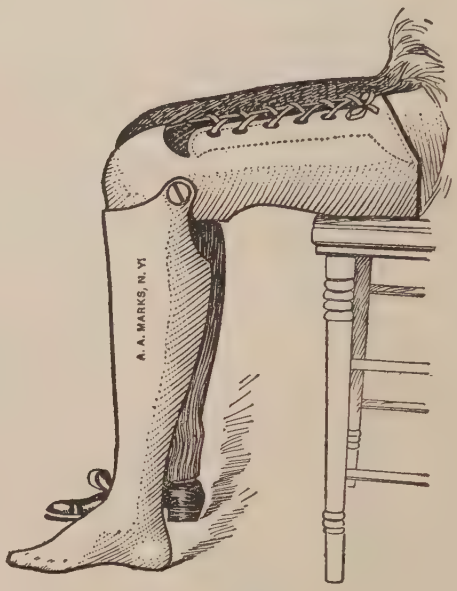
one end and threaded on the other. When the bolt is passing through the metal ear which is riveted to the lower leg the head sinks into its bed and the threaded end screws into the ear riveted to the opposite side. The set screw *b*, placed into the flanged end, prevents the bolt from moving and working out; *c* is the check cord screw; *d* the check cord; *g* the spring piston; *h* the spiral spring; *i* the cylinder. The relations and functions of these parts can be understood from an examination of Cuts F 7 and F 8, which show the leg with the knee extended and fully flexed.

The action of the spring holds the leg at flexion when the wearer is seated, and urges the leg forward when walking. The

range of articulation can be regulated by means of pads placed between the lower end of the check cord and the bridge under which it passes. These pads can be reached through the opening in the calf of the leg. The upper loops of the check cord rest in



Cut F 9.



Cut F 10.

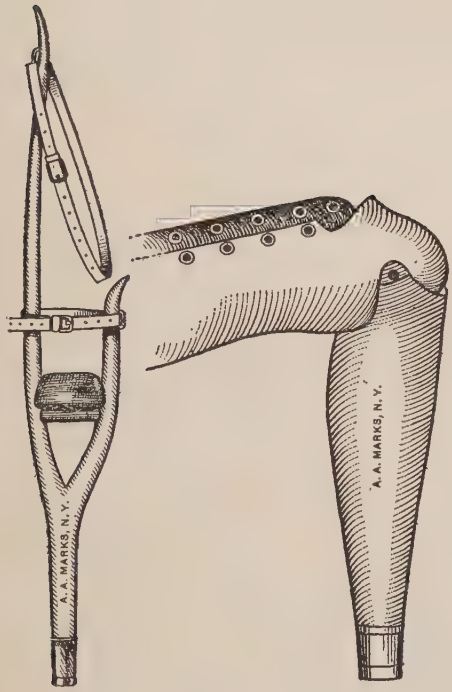
their respective channels and through them a steel screw is passed and set.

The mechanism of the knee-bearing leg is very durable, and will stand severe use for years.

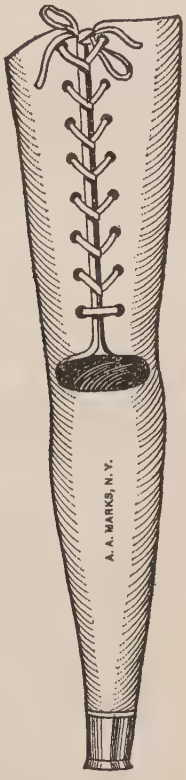
Side Joint.—The center of motion being placed below the natural knee, causes a disparity in the lengths of the two thighs; only noticeable, however, when the wearer is seated and subjected to close scrutiny. The durability of the knee-joint mechanism in style of leg shown in Cut F 5 fully compensates for excessive length of thigh, moreover, this mechanism admits of the minimum width of the knee. The choice of style remains with the wearer; if he prefers the wide knee to the long thigh, and is willing to sacrifice durability, he can have the leg constructed with side joints, as represented in Cut F 9, the center of knee motion of which is brought to the sides of the knee by means of hinge

joints, of the style shown in Cut E 23, page 52. The knee-check cord is practically the same as that represented in Cut F 6. Cut F 10 shows the leg applied, wearer seated with knees flexed.

Peg Legs.—Peg legs for knee-bearing stumps are of three kinds; and will be considered in their order: Cut F 11 shows the cheapest form of peg leg for a knee-bearing stump; its construction is of



Cut F 11.



Cut F 12.

Cut F 13.

bent wood with metal ferrule, rubber tips, and leather strappings. Cut F 12 shows a peg leg with knee joint suitable for a knee-bearing stump.

Cut F 13 shows a peg leg without knee articulation for knee-bearing stump. The upper parts, F 12 and F 13, made of wood and leather, fitted to receive the stump, which is held in place by lacing.

The ends of peg legs are terminated by metal ferrules and rubber tips as described in Cuts E 57, E 58, and E 59, page 71.

Incomplete Restoratives.—For reasons heretofore given, we do not advocate peg legs for knee-bearing stumps and only fur-

nish them when they are especially ordered. It is far better for a person to procure a complete artificial leg with rubber foot, with spring mattress, one that will possess all the elements necessary for helpful and convenient walking, even if he has to deny himself in other ways in order to obtain one. A peg leg is a makeshift, and will in all probability weaken or destroy what knee motion remains.

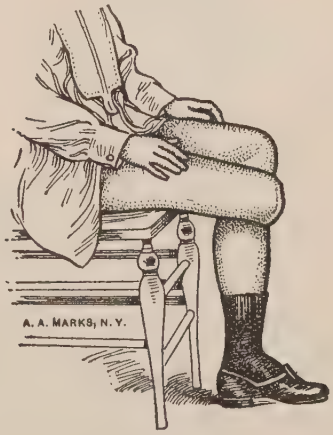
SUSPENDERS.—Suspenders suitable for knee-bearing legs are substantially the same as those employed for tibial stump legs. The details are given in the preceding chapter.

CHAPTER VII

DISARTICULATED KNEE STUMPS

End-Bearing and Non-End-Bearing Stumps. — Amputations through the articulations of the knees call for careful prothetical consideration. Stumps resulting from such amputations may be end-bearing or not; when they are covered with tissue flaps, free from cicatrices and nervous complications, they are end-bearing; if they are cicatrized, and sensitive, pressure must be applied elsewhere; if they are tapering to the ends or are broadened at the

Cut G 1.



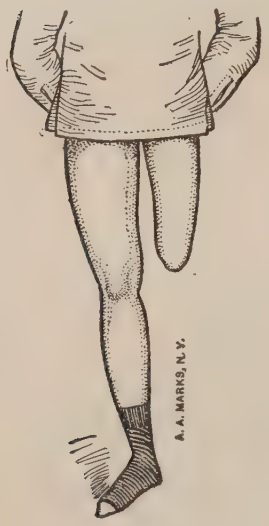
Cut G 2.

extremities they must be treated accordingly. The presence of the patella, securely united in the intercondylar space, will improve the character of the stump, but if it is not united it is doubtful if the end will tolerate any weight whatever.

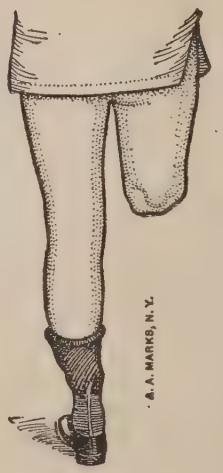
Fittings.—Artificial legs for knee-joint amputations must admit of placing pressure only on parts capable of enduring it. Tender, delicate, sensitive, and irritable spots must be guarded, and non-end-bearing stumps must be provided with limbs that will

take the weight at the ischial and perineal regions; if the sides of the stumps are sloping a share of the weight can be distributed over those parts. Sensitive condyles, bony prominences, and fascia must be properly cared for.

Peculiarities of Stumps.—Cut G 1 shows a type of stump resulting from knee-joint amputations; the nodulous extremity due to the presence of condyles, together with ample coverings, provide desirable conditions. An artificial leg suitable for this stump is so fitted that the weight is carried on the end, which rests on a padded surface at the lower end of the socket, and held securely in place by the leather lacing. The shoulder suspension is greatly simplified when condyles are present in the stump. Cut G 2 shows



Cut G 3.



Cut G 4.

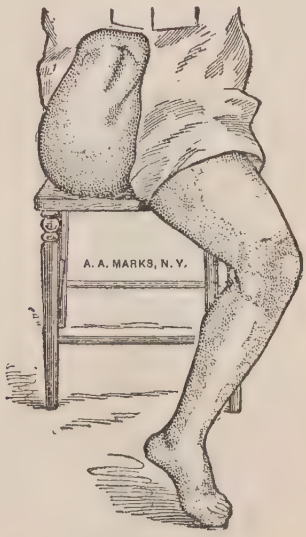
a side view of a stump favorable for end pressure. Cut G 3 shows a stump reaching to the knee, patella present and without cicatrices, thus admitting of end pressure.

Cut G 4 shows a thigh stump reaching to the knee and extremely well protected, with cicatrices at the rear and well away from the end; bunches of sensitive tissue hanging from the extremity prevent the application of weight at that point. Cut G 5 shows a thigh stump reaching to the knee with an end incapable of bearing pressure; the condyles and all the natural coverings of the bone were removed in the operation. Bunches of tissue and ganglia were gathered at the end back of the stump. The muscle tissue puckered considerably and the presence of cicatrices on and about the end prevents the application of weight there. Cut G 6 shows a stump reaching to the knee, condyles present, the extremity covered with integumentary folds, deep fissures and

cicatrices, preventing the application of weight upon the extremity.

Most Favorable Conditions.—These examples develop the following points: Stumps extending to the knee with nodulous extremities, capable of bearing weight, are the most favorable of all knee-joint stumps. They result from amputations through the

Cut G 5.



Cut G 6.

knee articulations, the condyles remaining untrimmed, or, if trimmed, the ends protected by bone and muscle flaps; the natural coverings to the bones permitted to remain on the articulating surfaces; the patellas, if present, firmly united to the end of the femur; flaps well carried to the posterior and the cicatrices some distance from the ends. Stumps possessing these favorable conditions can be efficiently accommodated with artificial legs that will minimize the pressure about their upper borders and simplify the mode of suspension.

A stump reaching to the knee, with a nodulous extremity and incapable of bearing weight on the end, is capable of operating an artificial leg, but the means of attachment are necessarily more extensive and more severe than when the weight can be borne on the ends.

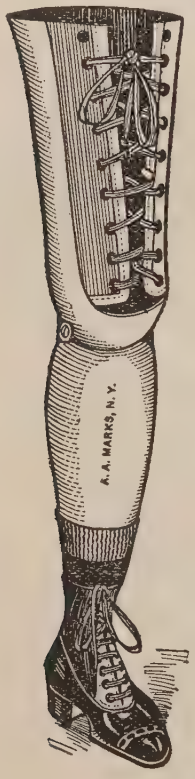
Inability to bear weight on the extremities of knee-joint stumps is not always due to surgery.

Sloughing, bone degeneration, hyperæsthesia, etc., frequently occur despite the most careful precautions of the operator.

Suitable Artificial Legs.—The foregoing cuts illustrate stumps that can be advantageously fitted with artificial legs con-

structed upon plans of those shown in Cuts G 7 or G 8, according as the stump is tapering or straight, or whether the end can endure weight or not. The thigh of either leg is made partly of wood and partly of leather. The rear section is of wood, excavated to receive the stump in the most comfortable way. The front portion is of leather arranged for lacing as shown. If the stump is tapering to the end there will be no advantage in having the front laced, the entire socket can be better constructed of wood.

Cut G 7 illustrates a leg made to place a large amount of the weight of the wearer directly on the extremity of the stump. Cut



Cut G 7.

Cut G 8.

G 8 shows a leg with annular top designed to hold the end of the stump away from the bottom of the socket, all the weight being distributed over the sides, above the knees and about the top borders of the socket. In both these styles every requirement for the comfort of the wearer and the efficiency of the leg is considered.

The stump socket of either leg is of proper size and shaped to receive the stump and carry the weight of the wearer.

Both upper and lower sections are made of selected kiln-dried wood, carved to the shape of the stump with external proportions as near those of the natural leg as the conditions will admit. The lower leg is excavated to reduce weight. The foot is of rubber as heretofore described, and both leg and thigh are coverd with suitable material properly enameled. The knee mechanism is the same as that illustrated in Cuts F 6 and F 7.

Suspenders for legs for knee-joint amputations are the same as those applied to thigh amputations, and are fully treated in the following chapter.

We point with pride to many thousand persons who walk on artificial legs of either the above type with efficiency and naturalness and who voluntarily bear witness to the excellence of the manner in which they have been fitted out, and their increased capabilities to perform their full share of work.

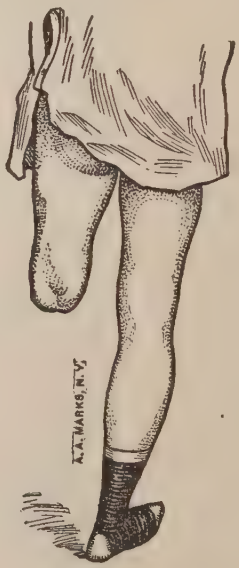
CHAPTER VIII

THIGH OR FEMORAL STUMPS

Definitions.—Thigh or femoral stumps are those that reach to any point above the knee joint; they are designated upper-, middle-, or lower-third thigh stumps, according to their lengths, in relation to the three divisions of the thigh.

Long or Lower-Third Thigh Stumps.—When a stump reaches to a point in the region of the lower third, it is commonly termed

Cut H 1.



Cut H 2.

a long thigh stump, a few of which are illustrated in Cuts H 1 to H 4.

Artificial legs suitable for such are illustrated in Cuts H 5 and H 6.

In cases of long and flabby stumps the number G 7 leg, see page 82, can be applied to advantage.

Stumps out of Line.—Persons walking on crutches for a considerable length of time permit their stumps to incline forward. The flexors in the groin become contracted and the extensors yield to the influence, and the stump assuming the position, when hanging at ease, of that shown in Cut H 1, and occasionally that

shown in Cut H 3. This condition should not cause anxiety on the part of the wearer, as it can be controlled and corrected by a suitably attached artificial leg.

Construction of Legs.—The thigh and leg sections of H 5 are constructed of wood of choice character. The socket is hollowed

Cut H 3.

Cut H 4.

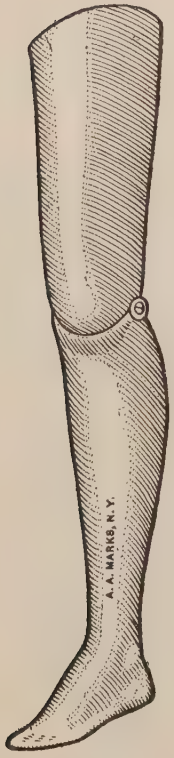
out to receive the stump properly, and to receive the weight of the wearer where it can be tolerated.

The outside dimensions both above and below the knee are dressed down to the curves and dimensions of the natural leg as far as conditions will admit. The lower part excavated to minimize weight, both sections are covered with rawhide and enameled, the foot is of sponge rubber with spring mattress as heretofore described. The manner in which the knee joint is constructed is substantially the same as shown in Cut F 6, and described on page 74.

Variety of Middle-Third Thigh Stumps.—Thigh amputations through or above the middle thirds produce stumps that admit of the simplest form of knee-joint mechanism, called the T joint, explained further on.

Cuts H 7 to H 14 show thigh stumps of a variety of lengths with flaps and cicatrices of many characters.

End and Non-End-Bearing.—As a rule thigh stumps are incapable of taking weight on their extremities, and as there is but little advantage in putting pressure on that point, and as the risk of doing so is very great, we rarely consent to construct limbs



Cut H 5.

Cut H 6.

Cut H 7.

Cut H 8.

in that way and only do so when we are positive that the ends of the stumps will not be injured. Cut H 15 shows the usual type

Cut H 9.

Cut H 10.

Cut H 11.

Cut H 12.

of artificial leg for a thigh stump. The thigh and leg sections are made of tough, light, bass or willow wood, shaped to the size and

contours of the natural leg so far as conditions will permit. The thigh is excavated to receive the stump in the best way, permitting pressure only at admissable places. The end of the stump, together with a few inches of the thigh, are, as a rule, required to hang in space, all the weight being applied to the upper borders of the thigh socket and along the sides of the stump immediately adjacent to the body. When weight can be prudently applied to the end a cushion is provided for that purpose. The lower section of the

Cut H 13.

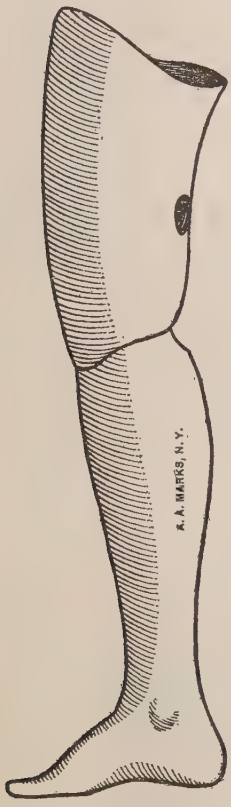
Cut H 14.

leg is excavated to reduce weight. The whole is covered with rawhide and elegantly finished with a flesh-tinted enamel.

A rubber foot with spring mattress as heretofore described, is properly attached at the ankle. Cut H 16 represents the rear view showing the knee mechanism with parts together, and Cut H 17 represents the working parts of the knee separated. Cut H 18 shows the T joint, the spring, and their connections; *a* is the T joint which is secured to the knee block located at the lower end of the stump socket. The two arms work in journals made in the leg section; *bb* are the cap screws that hold the T joint to its place; *cc* the caps; *d* the spring piston; *e* the spiral spring; *f* the cylinder; *g* spring cover, and parts of the spring together; *iii* represent the steel screws used to hold the T joint firmly to thigh. The joint *a* has the shape of an inverted T, hence its name, T joint. It is made of gun metal forged from one piece, turned,

drilled, and finished on the lathe. When the leg and thigh sections are placed together the arms of the T joint rest in boxes and are held by two hardwood caps, *cc,* which are secured by long steel screws, *bb,* which depend for their security on steel nuts, imbedded in the front part of the leg.

THOROUGH CONTROL.—The wearer has thorough command over this joint; the pressure of the caps on the joints can be regulated



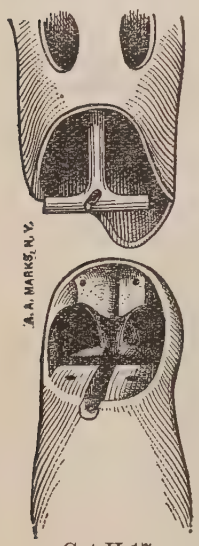
Cut H 15.

Cut H 16.

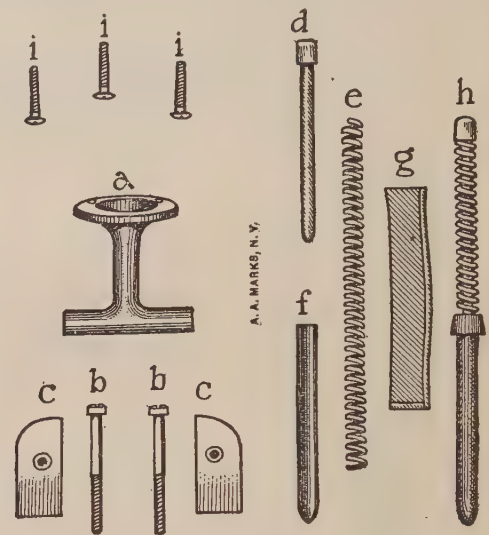
by the screws, and thus any desired tension on the articulation be made.

KNEE SPRING.—The small steel lever with ball on the end, projecting from the back of the joint, operates in the cavity of the hardwood piston *d;* the piston is inserted in one end of the steel spring, *e,* which has its lower part encased with leather *g,* and then placed in a drawn metal cylinder *f.* The lower convexed end of the cylinder is received on a bridge placed in the interior of the leg in the region of the calf.

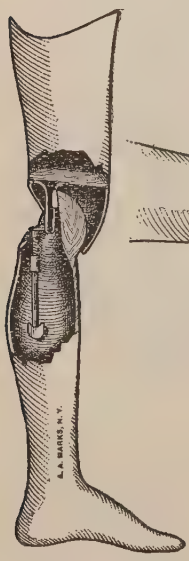
Helps Knee Motion When Walking.—The operation of the spring is twofold; it urges the lower leg forward in walking, and



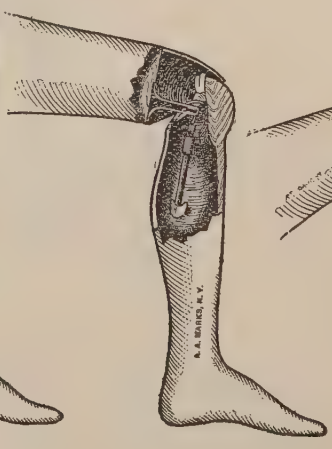
Cut H 17.



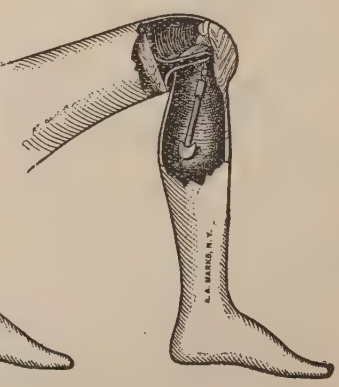
Cut H 18.



Cut H 19.



Cut H 20.



Cut H 21.

holds it at full flexion when sitting. This is done in the following manner: When the leg is extended, the point at which the

spring pressure is applied is on the end of a steel lever projecting an inch back of the center of motion in the knee. This urges further extension, as shown in Cut H 19, the lever revolves with the joint; and when the leg is partly flexed, as shown in Cut H 20, it has been carried to a neutral point where the spring neither urges flexion nor extension; but when the knee is further flexed, as shown in Cut H 21, the lever has passed forward of the neutral line and the spring forces the ball upward, urging greater flexion; and when the flexion is at its limit the leg is kept in that position by the spring. Thus the objection to the usual spring knee articulation is removed, that of the tendency of the leg to fly out when the wearer is sitting and unguarded.

Spring Strength Can be Regulated.—The power of the spring in the knee can be increased or diminished. If it is desired to increase it, a little packing can be tamped in the cylinder, or a longer spring can be substituted; and if it is desired to diminish it, a coil or two of the spring can be cut off or a shorter one substituted. If the wearer does not want the spring he can take it out and discard it. When the leg is together and in working order, the knee movement is arrested by the striking of the vertical shaft of the T joint against a pad placed in the knee, which can be increased or diminished by the wearer, and the range of articulation in the knee made less or greater, as may be desired.

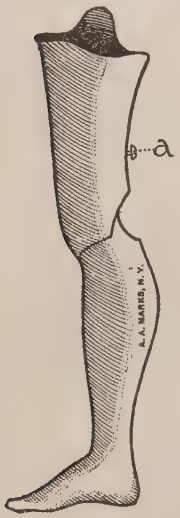
The center of motion of this knee is placed considerably back of the center of gravity of the leg in order to secure the knee against treacherous bending.

Knee Lock.—The knee lock is a device placed in the knees of artificial legs to keep them from flexing, or from flexing beyond a fixed limit. When the wearer wishes to sit the knee can readily be unlocked. It is not very often that knee locks are required, therefore they are only placed in artificial limbs when conditions demand.

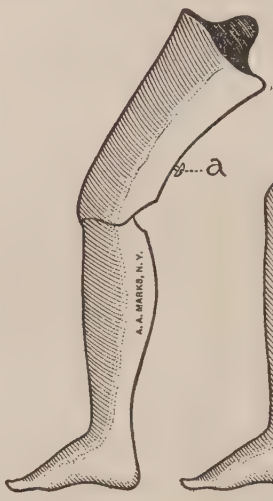
Cut H 22 shows an artificial leg with knee lock for thigh stump; *a* is a sliding bar that can be moved upwardly or downwardly. When down the leg is incapable of moving at the knee, or is permitted to move only through a limited angle, as shown in Cut H 23. When the sliding bar is pulled up, the lock is out of action, and the knee can be bent at right ankles as represented in Cut H 24.

This device is found to be of value to those who have short, weak, or deflected stumps, and is also used to advantage by equestrians. We have a patron, a baptist clergyman, who finds the knee lock indispensable when performing the rites of immersion; because of the buoyancy of the lower leg the knee without the lock would flex the moment he enters the baptismal font. Knee locks are used to advantage by persons who are required to walk through obstructions, such as underbrush, heavy grass, snow, etc.; without the locks these obstructions are likely to flex the knees inopportunely. Hip joints and waist belts are occasionally attached to the thighs of these legs.

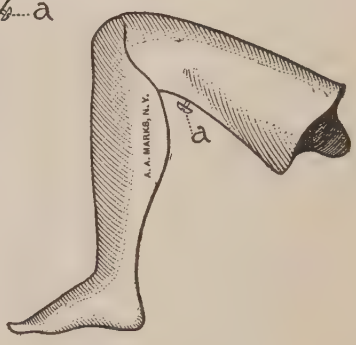
Hip Joints.—The knee lock, hip joint, and waist belt can be combined to advantage in legs applied to stumps that are deflected, abducted, or that in any way incline out of the normal lines. The knee lock places the knee beyond the influence of the partly flexed stump, and the hip joint places the leg beyond the influence of



Cut H 22.



Cut H 23.



Cut H 24.

the abducted stump. As these auxiliary parts complicate the construction of the leg, add weight, and more or less hamper graceful and natural walking, it is not considered desirable to add them unless the conditions of the stump or the occupation of the wearer demand.

Waterproof and Bathing Legs.—Persons wearing artificial legs on thigh stumps frequently find it desirable to use their artificial legs while they are bathing or swimming in salt or fresh water. It is embarrassing to those who have but one leg to be viewed with curiosity while hopping or walking with crutches or hitching on hands and knees on the shore. This embarrassment often prevents them from indulging in the exhilarating and health-giving river, lake, or ocean bath.

An artificial leg especially designed for swimming and bathing purposes is constructed practically the same as those heretofore described, differing only in the fact that they are absolutely waterproof, the knee to articulate or not, as the wearer may elect. As the wearing parts of waterproof legs are made of composition instead of steel, they are not as durable as those made for ordinary purposes; they are therefore only made when especially ordered.

Legs Without Knee Joints.—We have on a number of occasions been required to construct artificial legs for thigh stumps without

knee joints. Cut H 25 shows an artificial leg of this type. The entire structure, including the foot core, is carved from a single piece of wood, slightly curved at the knee so as to represent the natural leg when partly flexed, for better accommodation when sitting. The foot is of rubber with spring mattress as described. The leg is covered in the usual way and enameled or waterproofed if it is to be used in watery places.

Peg Legs—Peg legs are occasionally used on thigh stumps. They are practically artificial legs without feet. As already stated we do not advocate the use of peg legs, as they are of limited effi-

Cut H 25.

Cut H 26.

Cut H 27.

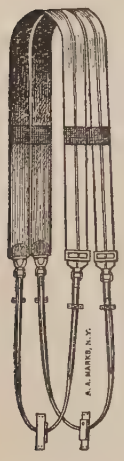
ciency. The foot is a very important part of an artificial leg. It assists in balancing, aids in walking, and restores the appearance.

Years ago before artificial legs with rubber feet and spring mattress were so generally used, the peg leg was more in evidence, but lately it is worn more as a means of disciplining the stump or as a makeshift to bridge an impecunious period.

Persons are able to stand, stump about, and perform a limited amount of labor on peg legs, which are unquestionably better than

crutches, but their restoration is not complete until they are wearing artificial legs with spring mattress rubber feet. Cut H 26 shows a peg leg for a thigh stump. It is made of suitable wood, excavated to receive the stump and reduce weight. The outside has the contours of nature as closely as the conditions will admit, the end terminating in a metal ferrule and rubber tip, as illustrated on page 71, Cuts E 57-58-59. Cut H 27 shows a peg leg with knee joint, for a thigh stump. It is constructed in all parts the same as H 15, heretofore described. The absence of the foot and the substitution of a rubber tip is the only difference.

SUSPENDERS.—Suspenders suitable for legs for thigh amputations, as well as for amputations in the knee joint are of various kinds to suit the habits and demands of the wearers. The style of suspender which is most generally adopted is that illustrated in Cut H 28, termed the roller suspender. While it has excellent



Cut H 28.

Cut H 29.

Cut H 30.

features it has limited application. It can be used to advantage on stumps reaching to any point from the middle of the thigh to the knee, but for shorter stumps and for hip-joint amputations a method that will hold the limb to the body more firmly is necessary. The roller suspender is the product of many experiments and years of experience, assisted by the kindly suggestions of our patrons.

The shoulder straps are usually of two-inch non-elastic webbing. A strip of webbing is attached to the right strap, and forms a loop through which the left strap passes. A piece of webbing stitched to the back of both straps holds them together. The front lower ends of the shoulder straps are received into buckles, and the back lower ends are terminated by snaps; each hooks into the ends of the leather roller cords which pass around rollers attached to

either side of the leg. Any degree of pressure upon the shoulders can be obtained by means of the clamp buckles, and when obtained, the buckles are clamped and are never disturbed, unless the pressure on the shoulders needs further adjustment. When it is desired to remove the limb, the suspenders are detached by unsnapping both front and back.

Cut H. 29 shows a front view of a person wearing a pair of roller suspenders.

Cut H 30 gives the back view, and Cuts H 31, H 32, and H 33 side views.

These cuts show the relative positions of the rollers, as well as the effect of the loops in holding the shoulder straps in place and

Cut H 31. Cut H 32. Cut H 33.

in directing the leg. Elasticity is obtained by two pieces of elastic webbing attached to the backs of the shoulder straps a little below the shoulder blades.

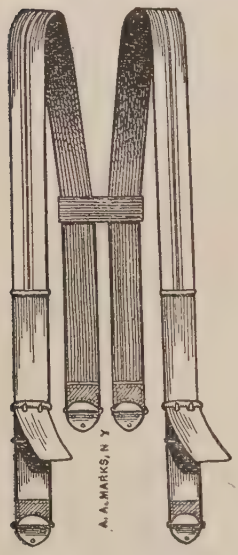
The operation of the suspenders is illustrated in Cuts H 29-30-31-32-33. All the traveling of the suspenders due to changes of position takes place about the rollers on the sides of the thigh, instead of on the shoulders of the wearer, whether the person is standing, stooping, walking, or sitting.

Straight Shoulder Straps.—Cut H 34 shows a style of suspender especially adapted to an artificial leg for a short thigh stump. It is the style very generally used before roller suspenders were devised. The shoulder straps are of fine elastic webbing, 2 inches wide.

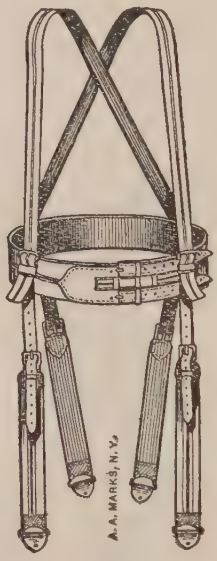
The front straps are of two-inch non-elastic webbing; each front strap passes through a metal link attached to the lower end of the elastic shoulder strap. After passing through the metal link the front straps are received into a two-prong buckle. The sus-

penders are attached to the leg by means of leather tags and metal D's screwed to the back and front. The metal D admits of side motion, thereby insuring direct pull.

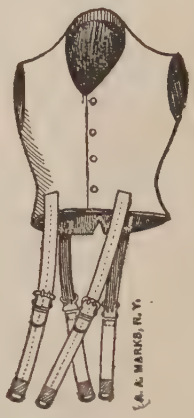
Belt Attachment.—Cut H 35 represents a belt and suspender combined. The shoulder straps and belt are preferably of non-elastic webbing. The straps running from the belt to the leg are



Cut H 34.



Cut H 35.



Cut H 36.

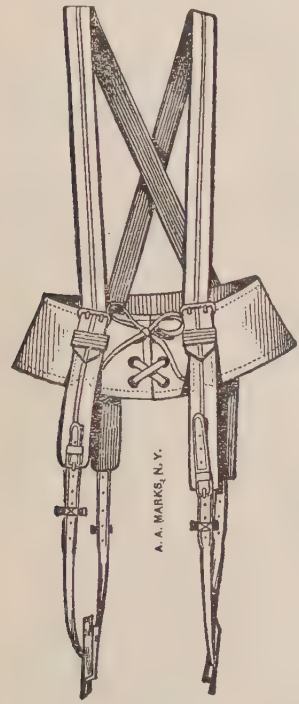
made of elastic webbing, 2 inches wide or less, as the case may demand.

Vest Method.—Cut H 36 illustrates the vest method. It is made of strong muslin, fitted to the person and worn under the shirt. Elastic straps are attached to the lower border and buckled into straps that are secured to the leg. In order to obtain the best results, the vest must be made and fitted by a tailor. Persons who desire to have their artificial limbs constructed from measurements, and choose the vest suspender, are required to have vests made at home, and if sent to us, we will attach the straps and make the proper connections with the leg without additional charge.

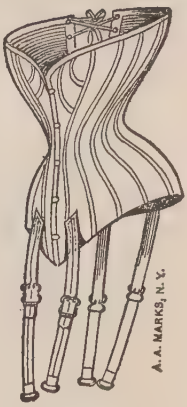
Suspenders for Women.—For obvious reasons the means of suspending artificial limbs to women differ from those employed with men. When shoulder straps are used they must pass over the shoulders and not press upon the breasts. Yokes, girths, or bands must pass around the waists so as to place the burden all or in part on the hips.

Yoke Method.—Cut H 37 shows a combination of the roller straps with the yoke; rollers or pulleys are secured to the sides of the thigh, and leather cords pass around them. The yoke is made

to fit the loins and hips, adjustable by lacing in front or on the sides, as may be preferred; the shoulder and roller straps are also



Cut H 37.



Cut H 38.

adjustable, so as to bring the proportionate weight about the shoulders and hips without displacing the yoke.

Corset Method.—As many women pride themselves on their trim waists and neat-fitting garments, it is especially desirable that means of leg suspension should be light and neat. Straps securely sewed to the corset, extending downward and connected with the artificial limb, admit of the neatest adjustment. Cut H 38 shows the corset method, which can be easily adjusted by the wearer.

CHAPTER IX

HIP-JOINT AMPUTATIONS

Requirement.—An amputation at the hip joint or close to the body requires an artificial leg identical in construction to either of the patterns heretofore described for thigh stumps, with the exception that some modifications are introduced in the knee and the means of suspension is more complex.

Muscle Stump.—Cuts I-1 and I-2 illustrate front and side views of amputations at the coxo-femoral or hip articulation, leaving a stump composed entirely of muscle tissue. A muscle

Cut I-1.

Cut I-2.

Cut I-3.

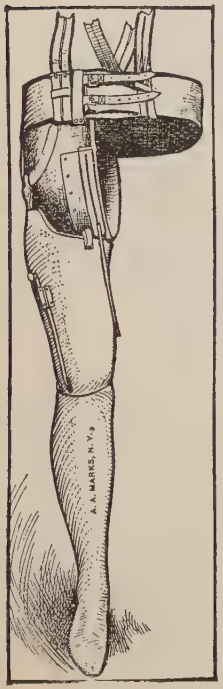
stump is capable of performing some functions, although limited, in the management of an artificial leg, and may be considered as more desirable than no stump at all. Cuts I-3 and I-4 represent a hip-joint amputation in which there is no protruding stump by which the artificial leg can be directed. The amputated surface at the base of the pelvis is capable of bearing pressure.

Leg Applied.—Cuts I-5 and I-6 show a leg applied to hip-joint amputation having muscle stump. The means by which it is suspended consist of a waist belt, shoulder strap, over each shoulder, flexion and extension elastic straps, a metal hip joint

Cut I-4.

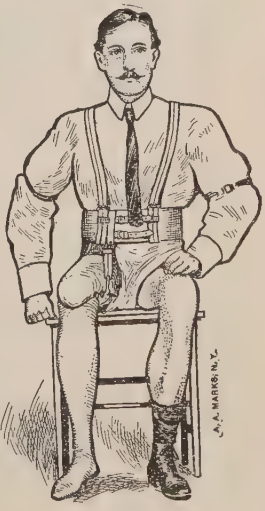
Cut I-5.

Cut I-6.



Cut I-7.

Cut I-8.



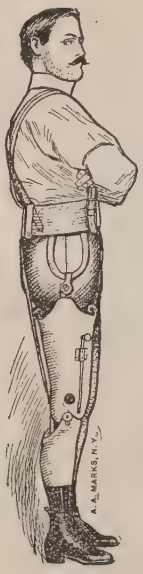
Cut I-9.

substituting the natural hip articulation, and an attachment by which the knee can be locked and made immovable, or capable of having but limited motion, these features have all been explained in the preceding chapter.

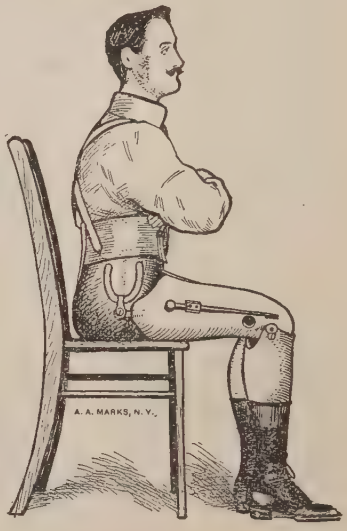
The hip joint is important as it keeps the artificial leg directly under the wearer. The waist belt with its elastic straps front and rear assists in flexing and extending the leg at the hip. The leg is held firmly to the body when standing or walking; it should be especially noted, that it is not advisable to allow any knee motion while the wearer is learning to control the leg. During this period the knee motion is only for sitting convenience.

Cut I-7 shows a leg with pelvic socket suitable for a hip-joint

Cut I-10.



Cut I-11.



Cut I-12.

amputation where there is no protruding stump to control the artificial hip motion.

Cuts I-8, I-9, I-10, I-11, I-12, show the leg applied and the wearer in many positions. The pelvic socket takes in a part of the pelvis and holds the artificial leg firmly to its place no matter what positions the wearer may assume. The hip joint is controlled by throwing the body forward or backward of the center of gravity of the leg.

Artificial legs for hip-joint amputations support the amputated side in a very comfortable and natural manner. The leg, having little or no stump to control it, is thrown forward by means of a side motion of the body. Persons with reasonable perseverance soon learn to control legs under these conditions in an advantageous way.

CHAPTER X

BOTH-LEG AMPUTATIONS

The triumphs of artificial limb-making are shown to advantage in the restoration to active life of those who have had both of their lower extremities removed. When such persons are enabled to get about freely, walk gracefully, and engage in such labors as their callings in life require, a great and beneficial work has been accomplished, and the strongest possible evidence is presented to show that the mind of the prothesist has not been passive during

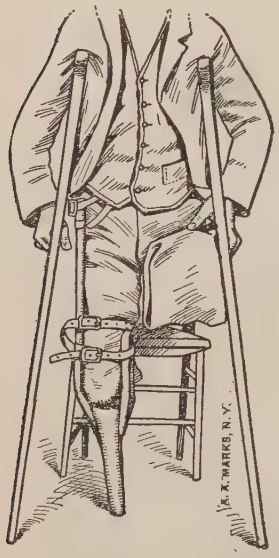
Cut J 1.

Cut J 2.

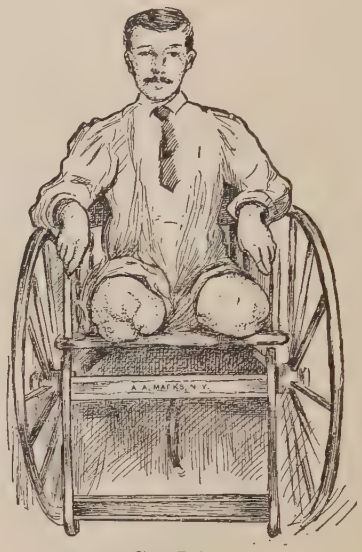
the past half century. The problems these cases present are profoundly difficult, thought and effort have never been given to more laudable purposes than to their solution. The amelioration of the conditions of these unfortunate persons commands the highest talent and the most humane impulses.

Ancient Methods.—But a short time ago the loss of both legs was regarded as irreparable. The person who met with that misfortune was either consigned to a wheel chair, or obliged to hitch himself about on his knees or haunches. Cuts J 1 to J 4 show some of the various methods employed by those deprived of both their limbs. Formerly these methods were the only means for

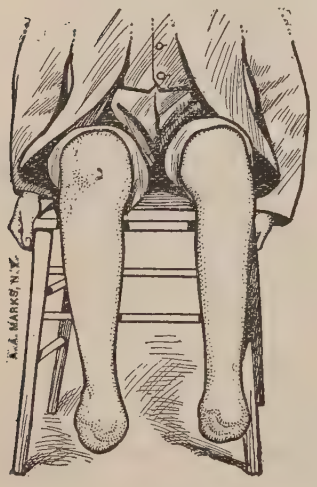
locomotion the subject could employ. But at the present time the methods are used preliminary to obtaining and wearing arti-



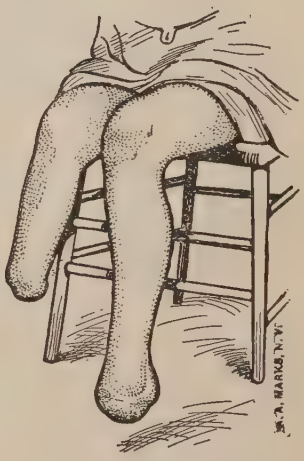
Cut J 3.



Cut J 4.



Cut J 5.



Cut J 6.

ficial legs. When these methods are contrasted with those that are shown later on, the progress and developments that have been made in the adaptation of artificial legs will be in plain view.

Both Feet Partly Amputated.—Cut J 5 shows a case in which

both feet were removed at the insteps; a pair of artificial legs constructed on the plan of Cut C 18, page 32, was applied.

Lower Instep and Leg Amputations.—Cut J 6 shows an amputation of the left foot at the instep and of the right leg at the junction of the lower and middle third. Artificial legs C 18 and E 17 were applied.

Both Feet Amputated at the Ankles.—Cut J 7 shows a double ankle-joint amputation with the extremities incapable of

Cut J 7.

Cut J 8.

bearing pressure. A pair of artificial legs, constructed on the plan of D 21 and described on page 43, was applied. Cut J 8 shows the same case with the legs applied and the wearer standing. In this particular instance the amputations resulted from frostbite, and the extremities of the stumps were very sensitive and with impaired circulation. It was therefore necessary to avoid interference with circulation and to secure the absolute freedom of the extremities from contact.

Ankle Joint and Knee Amputations.—Cut J 9 shows an amputation of the left foot at the ankle after the Pirogoff method, and the right leg at the knee joint after the Gritti operation;

Cut J 9.

Cut J 10.

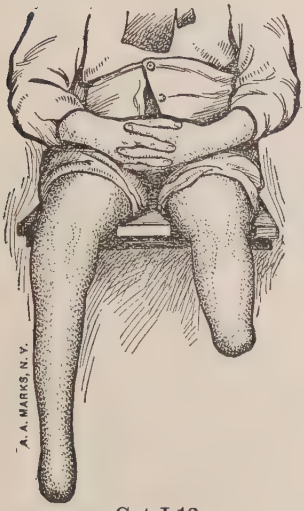
Cut J 11.

Cut J 12.

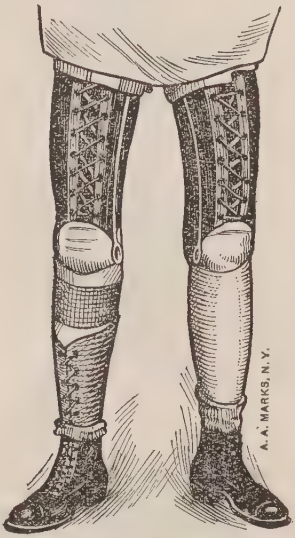
artificial legs D 12 and G 17 were applied. Cut J 10 presents the wearer with artificial legs applied and attired as in daily life.

Upper Instep and Leg Amputations.—Cut J 11 shows an am-

putation of left foot at the instep and the right leg at the middle third. Artificial legs C 18 and E 17 were applied. Cut J 12



Cut J 13.



Cut J 14.

Cut J 15.

Cut J 16.

shows the wearer with the legs applied, engaging in his occupation as oysterman. This person has been employed in that industry for many years, and finds himself unhampered in his work.

Cut J 13 shows an amputation of the right foot at the instep and of the left leg immediately below the knee. The right foot was poorly nourished, and sensitive at the extremity, so much so as to completely prohibit any pressure. Cut J 14 illustrates the same case with D 21 and E 17 legs applied.

Both-Leg Amputations.—Cuts J 15 to J 21 illustrate amputations of both legs at various points between the knees and ankles, covering many lengths, characteristics of flaps, and situations of

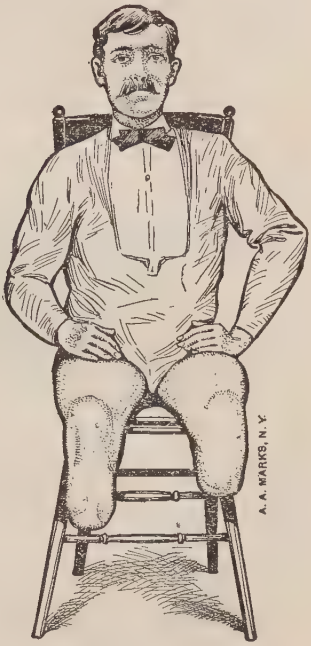
Cut J 17.

Cut J 18.

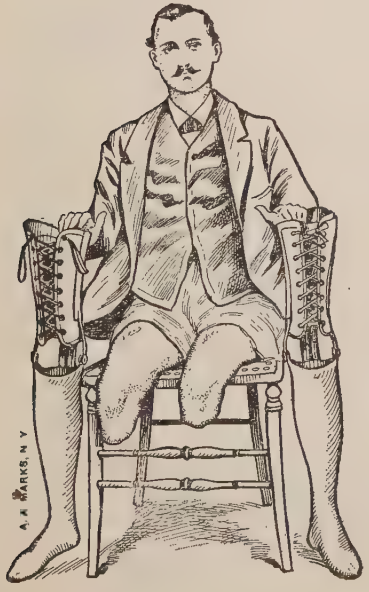
cicatrices. Artificial legs suitable for any of these amputations, as shown in Cut J 21, are constructed on the plan of E 17. Cut J 22 shows the legs applied. The freedom with which wearers of legs for double amputations can get about, the naturalness with which they can sit, lie down, stand, walk, ascend elevations, ladders, ride bicycles, skate, and engage in almost any occupation are shown in Cuts J 22 to J 32.

Practical Results.—Persons wearing two artificial legs are so thoroughly in control of their means of locomotion that they go about much as other people. They readily resume their former occupations, no matter how arduous they may have been. Cut J 28 illustrates a case of double-leg amputations with artificial legs E 17 applied. A short time after obtaining the legs the wearer resumed his work of baggage master, lifting heavy trunks, carrying them about, and putting them on trains as one would

Cut J 19.



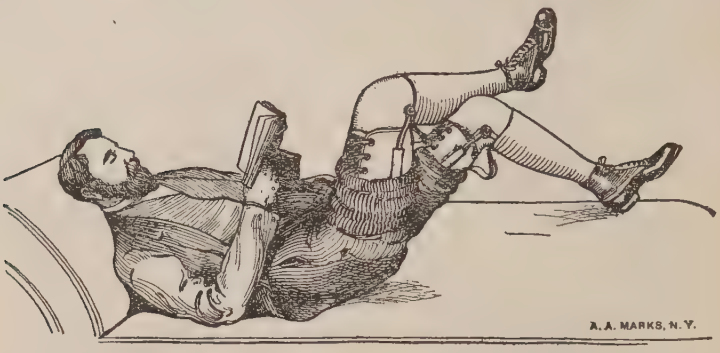
Cut J 20



Cut J 21.

Cut J 22.

do with natural legs. Cut J 29 portrays a railroad man with two artificial legs operating a switch. He dismounts, attends to the



Cut J 23.

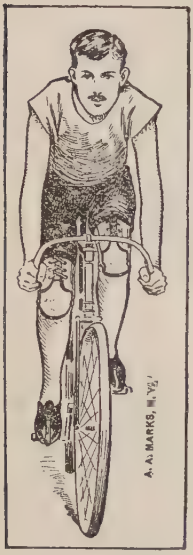
switch, frequently gets aboard while the train is in motion, and performs the work of a brakeman. He moves about quickly, steps over ties, and appears to be on as firm footing as if he had never

Cut J 24.

Cut J 25.

been deprived of nature's extremities. Cut J 30 shows a young man wearing two artificial legs, plan E 17; he is a conductor on a railroad, performing his duties in a thoroughly efficient manner.

He walks through the train when it is running at its greatest speed, collects tickets, and punches them. The cars jolt, pitch,

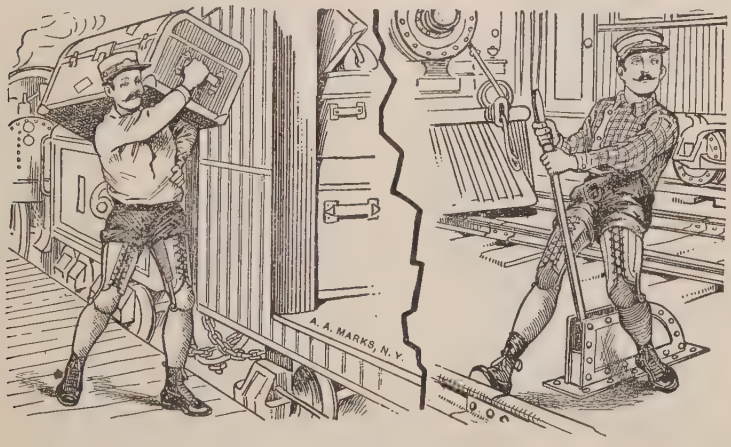


Cut J 26.

Cut J 27.

and sway, but he retains his balance with no perceptible effort or awkwardness.

At stations he alights, watches passengers, gives signals, and boards his train. It never occurs to anyone that his lower ex-



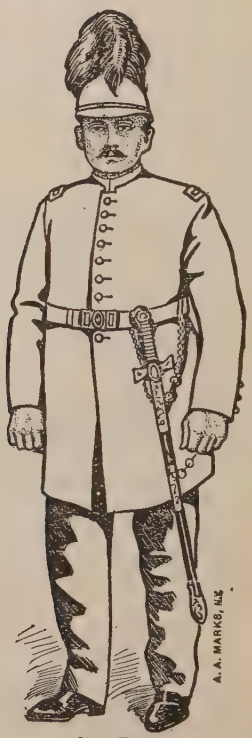
Cut J 28.

Cut J 29.

tremities are not real, and his actions never betray that fact. With wooden articulating feet it would be extremely difficult for

Cut J 30.

Cut J 31.



Cut J 32.

him to discharge such duties. He would feel unsafe, tottlish, and unsteady, but with rubber feet with spring mattress, rigidly attached, he has sound footing, and is capable of the most difficult feats of balancing.

Below-Knee and Knee-Joint Amputations.—Cut J 31 represents a case with both legs amputated; the right disjointed at the knee, and the left amputated three inches below the knee; Nos. E 17 and G 7 legs were applied. This man when in street

Cut J 33.

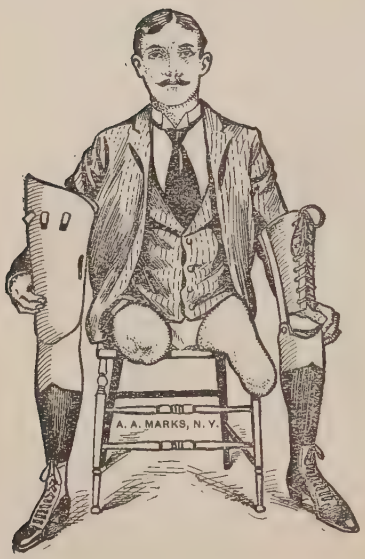
Cut J 34.

attire presents the appearance of a person with natural extremities. He walks naturally, and never consents to use a cane. He is a member of the Knights of Pythias, and takes pride in parading with his lodge. Cut J 32 shows him in his uniform.

Below-Knee and Above-Knee Amputations.—Cut J 33 represents amputations of both legs, the right below the knee and the left above the knee. Cut J 34 represents the same case, with E 17 and H 15 legs applied.

Cut J 35 shows a similar case; the right stump only five and one-half inches from the body, and the left one and one-half inches below the knee. E 17 was applied to the left side and H 15 to the right. The subject was restored to not only a natural appearance, but to the ability of walking without the aid of

canes or crutches, and so naturally that he has associated with persons for long periods without betraying the fact that his lower limbs were artificial. This young man has walked half a mile



Cut J 35.

Cut J 36.

in eight minutes without great effort. He works at the bench during the day, and the evenings are frequently spent at the billiard table. Cut J 36 shows him as he appears on his artificial legs, and in street attire.

Engaging in Former Pursuits.—We have many patrons wearing E 17 and H 15 artificial legs for double amputations who exhibit remarkable skill in performing feats that require sound footing.

Cut J 37 shows a person with two artificial legs as above described in a rowboat, illustrating the manner in which he can brace himself while pulling a strong oar.

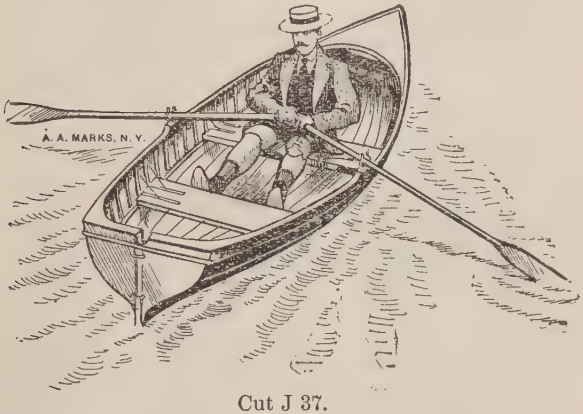
Cut J 38 shows another similarly equipped at the pool table, balancing himself on one foot while making a difficult shot.

Cut J 39 represents another with thigh and leg amputation, on a ladder, at a great distance from the ground; his footing is sound, his arms are free; he can hold a paint can in one hand, while he applies a brush with the other.

Cut J 40 represents another riding horseback, securely seated in the saddle, and feet in stirrups. The spring mattress rubber

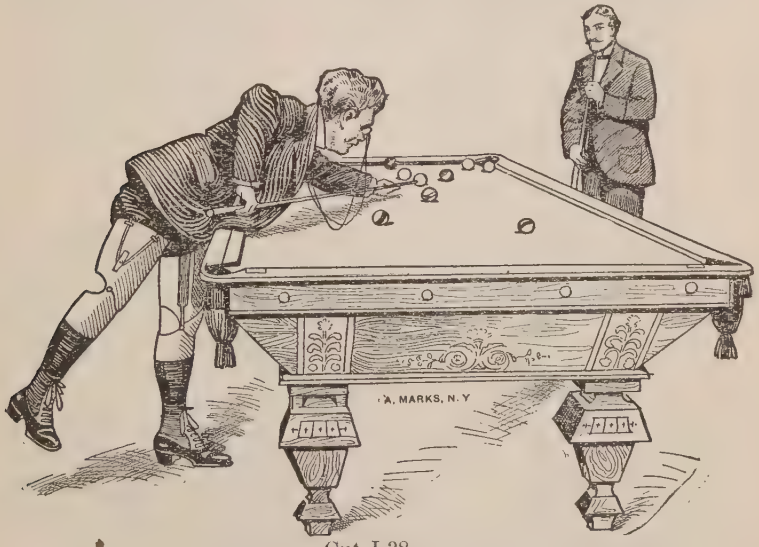
feet are used in all of these cases, and sound and reliable footing are due to the excellent feature obtained by that means.

Both Legs and Both Arms Amputated.—Cut J 41 represents a case in which both legs and both hands were amputated. A



Cut J 37.

pair of artificial legs, and a pair of artificial arms were applied. The wearer became able to walk about in a very natural way; his artificial arms enabled him to feed himself at the table, write,



Cut J 38.

and perform such work as does not depend upon delicate finger movements and the sense of touch.

Both Legs Amputated Above the Knees.—No matter how extensively a person may be dismembered, prothetic science is ca-

pable of rescuing him from a life of helplessness. Only a brief period has elapsed since it was considered rash to apply a pair of artificial legs to a person who had both of his natural legs amputated above the knees. Attempts to substitute such a large portion of the body depending on short thigh stumps for support, resulted in failures, and until modern ideas were introduced and appropriate means for attachments were devised, failure followed

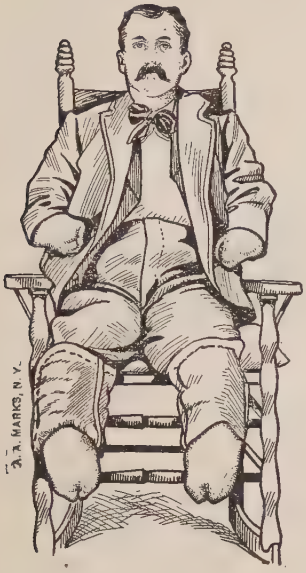
Cut J 39.

Cut J 40.

every effort. In 1864 the first pair of artificial legs was applied to double thigh amputations; the subject was a soldier of the Civil War. Although he was able to sit, stand, and walk on his artificial legs, the effort was so great that the wearer soon tired of them and abandoned their use, and became the occupant of a wheel-chair, dependent on his family.

In 1879 Mr. Marks made his second attempt, and succeeded admirably. The subject was a young man with two thigh stumps that reached nearly to the knees. This man soon acquired the art of balancing, and became so adept that he could walk about the house without the aid of canes or crutches, but when in the street he found it necessary to use a pair of canes. He has worn the pair of legs made in 1879 up to the present time. He is engaged in active business pursuits, and has reared and supported a large family.

Since the above date we have applied upwards of a hundred pairs of artificial legs to double thigh amputations. The manner



Cut J 41

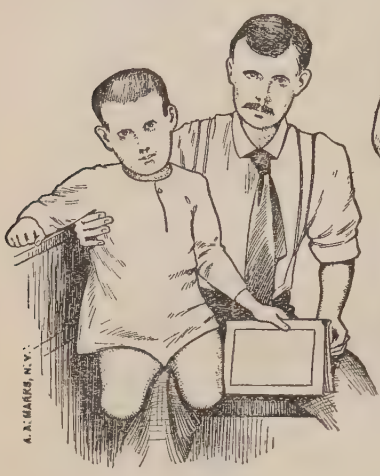
Cut J 42.

Cut J 43.

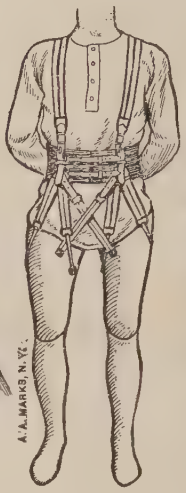
Cut J 44.

in which these limbs were constructed, the way in which they were applied and adjusted, and the methods employed to give better control of the movements have varied according to the conditions

of each case. Each double thigh amputation presents problems of an individual character, and as there are seldom two alike,



Cut J 45.

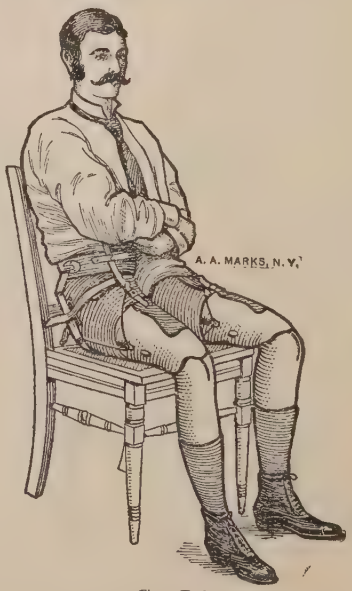


Cut J 46.

Cut J 47.

these problems must be solved by the manufacturer. The solution lies in the hanging of the legs, the method of suspension,

Cut J 48.



Cut J 49.

limiting the motion of the knees, and the absolute rigidity of the ankles. We cite a few cases.

Cut J 42 represents double thigh stumps, produced by amputations made to remove deformed parts. A pair of artificial legs of suitable construction was applied. The great lengths of these stumps gave such control over the artificial limbs that it was not necessary to apply hip joints or knee locks. The subject was a musician. In a brief time he was able to walk naturally, resuming his profession, and now has a national reputation as a clarionetist. He walks on the stage, plays the instrument, acknowledges encores, and retires in the usual stage manner.

Cut J 43 represents a double knee joint amputation. A pair of suitable artificial legs are shown in the same cut. Cut J 44

Cut J 50.

Cut J 51.

shows the artificial legs applied, and the wearer in the act of walking.

Cut J 45 represents a child who had both legs amputated above the knees on account of a railroad accident. A pair of artificial legs with knee locks was applied to advantage. The child has, for a number of years, walked on the artificial legs very satisfactorily. He has been enabled to walk to school and indulge in childish pastimes. The manner in which the artificial legs were held in place is shown in Cut J 46, front view, and Cut J 47, rear view.

Cut J 48 represents a double thigh amputation, the result of a railroad accident. Cut J 49 shows the application of a pair of artificial legs with the wearer seated. Cut J 50 represents the same person standing, and in Cut J 51 he is attired as he appears when walking. This case is one of the most remarkable on record. The stumps only extended to about the middle of the thighs, but through the energy of the wearer and the efficiency of the artificial legs, he was able, in a brief time, to walk about in a very natural way, and go up and down stairs; he uses no canes about the house. The artificial legs H 15 were applied with hip joints and automatic knee locks, but after a brief time the wearer dispensed with the locks and found that he could control the artificial knee joints without danger of treacherous flexing. Under earlier systems this case would have been considered hopeless, and the thought of applying artificial limbs would never have been entertained.

CHAPTER XI

ARTIFICIAL FEET AND LEGS FOR DEFORMITIES, PARALYSIS, EXCISIONS, ARRESTED GROWTH, SHORTENED LEGS, ETC.

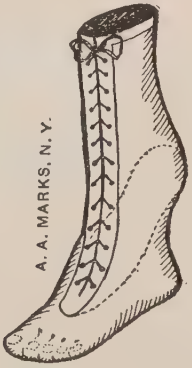
Deformities of the feet or legs may be due to causes congenital, traumatic, or pathological. Appliances for such cases frequently partake of the character of artificial legs and call for the skill of the prothetician.

No matter how greatly distorted, deformed, or weakened one or both legs may be, there is reasonable hope that some appliance can be used that will aid locomotion, hide the affected parts, and restore a fair degree of symmetry to the person.

Short Leg.—The most frequent leg abnormity is that of shortening, due to hip-joint troubles in infancy, or to paralysis.

Cut K 1.

Cut K 2.



Cut K 3.

Cut K 1 represents a case of shortened leg caused by hip dislocation. The front of the foot is dropped downwardly to enable the subject to walk on the ball of his foot.

Talipes-equinus.—Cut K 2 represents a case of talipes-equinus, leg shortened from one to three or more inches, due to paralysis. The ankle joints in K 1 and K 2 were normally strong and the knees and hips under thorough control. Cut K 3 shows an appliance suitable for either of the above cases. It is termed an extension foot, and is constructed from a wooden block, the upper surface shaped to receive the sole of the affected foot, with the front part dropped to a convenient angle (see dotted line). The

under surface of the block is connected with the lower part of a rubber foot. The entire structure is covered with suitable leather, the upper of which runs well up on the leg, incasing the entire foot and ankle. Cut K 4 is a shoe, to be drawn over the foot and appliance. It is usually a part of the mate of the

Cut K 4.

Cut K 5.

Cut K 6.

shoe worn on the opposite foot, the quarter having been removed and a larger one put on having the shape and dimensions required to fit properly. This alteration in the shoe is easily made, and can be done by any shoemaker at slight expense. The extension, when complete and covered by a shoe, is shown in cut K 5. Cut K 6 shows it covered with the trousers. Persons with these appliances walk much better than they do with the old style, thick sole and high-heel shoe. They present a better appearance and are far more comfortable.

Talipes with Lateral Weakness.—Cut K 7 represents a shortened leg with talipes and loss of control over the ankle joint, there being a strong tendency for the ankle to give way sidewise. A suitable appliance is shown in the same cut. It is constructed of wood, carved from a block with naturally curved grains, or made of aluminum, as conditions require. It receives the leg and foot in a comfortable way and holds them firmly in place. The heel and toes are of rubber. Cut K 8 represents the case with appliance in place and wearer walking. In cases of atrophy of the calf, which frequently accompanies these cases, the leg structure can be carved to approximate the contours and dimensions of the sound leg. There will scarcely be an appreciable increase in weight.

Toe Support.—An appliance of above type is helpful in holding the foot in correct position, and on account of the rigidity of the ankle the wearer obtains toe support that enables him to rise on the ball of the foot when walking. This produces a natural

step, avoids limping, and enables the wearer to go up and down stairs and alight on elevations. It also aids him in balancing, and, as the point of resistance at the ball of the foot is in advance of the knee joint, the tendency of the knee to flex is counteracted; this adds materially to the efficiency of the apparatus, giving the wearer a feeling of confidence and security. A person

Cut K 7.

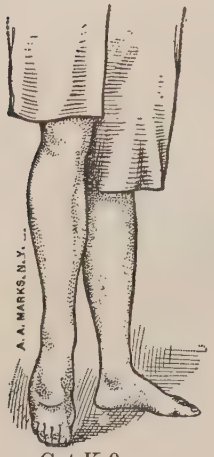
Cut K 8.

with a paralyzed leg, using ordinary braces, usually finds it necessary to press his hand against his knee joint when his weight is on the affected leg. He does this to keep the knee from flexing and precipitating a fall, but with the appliance just described firmness of the knee joint is obtained by phalangeal support in the foot, and the wearer is not dependent on pressure placed in his knee joint, or on attachments going above the knee.

Cut K 9 shows a shortened leg with hip and knee joints under control; the ankle suffered a loss of strength and required supporting.

Cut K 10 represents a leg shortened by hip-joint trouble in youth, producing a deficiency in length of about ten inches; the knee and hip joints are under control and the bottom of the foot is capable of bearing weight. Cut K 11 represents a leg, designed for each of the above cases, the natural foot is dropped to the greatest angle that can be tolerated and made to rest on an

inclined surface at the required distance from the floor. The leg is incased by a socket made of wood and leather. Cut K 12



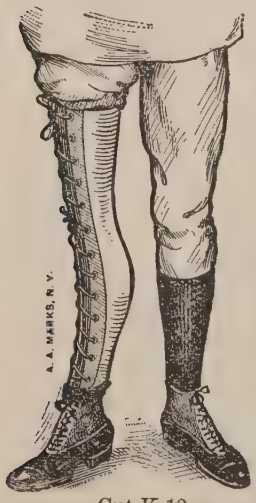
Cut K 9.

Cut K 10.

Cut K 11.

represents the appliance in place, and Cut K 13 shows the patient properly and neatly attired.

CONGENITAL DEFORMITY.—Cuts K 14 and 15 illustrate the front and side views of a case of congenital deformity. The foot



Cut K 12.

Cut K 13.

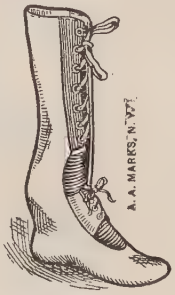
appears to be attached to the external side of the tibia immediately under the fibula. Weight can be borne on the sole only when the foot is held in position. Cut K 16 gives a side view of

a suitable appliance constructed substantially the same as K 11. The displaced foot is held firmly in correct position and the wearer walks helpfully and quite naturally.

Talipes-varus.—Cut K 17 represents a case of talipes varus, resulting from paralysis—the knee joint being involved. A suit-

Cut K 14.

Cut K 15.

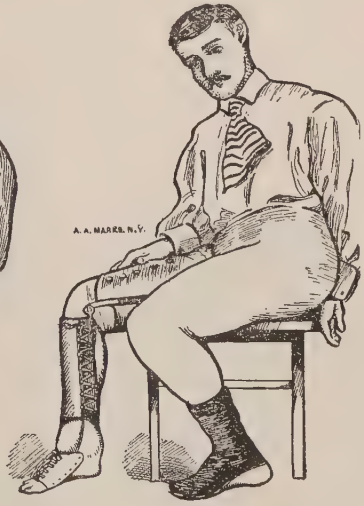


Cut K 16.

able appliance is shown in the same cut. Cut K 18 shows appliance in place and the wearer seated; with this appliance the wearer is enabled to walk acceptably.

Leg Deformities.—Cut K 19 represents a deformed right leg. From the knee down, the leg is diminutive, terminating in a

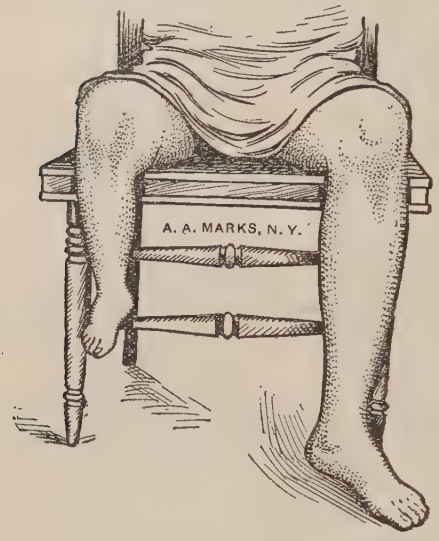
Cut K 17.



Cut K 18.

miniature foot, inclined inwardly and backwardly; the shortening due to arrested development amounts to eight inches. Cut K 20 shows a suitable leg. The deformed leg, from the knee down, is

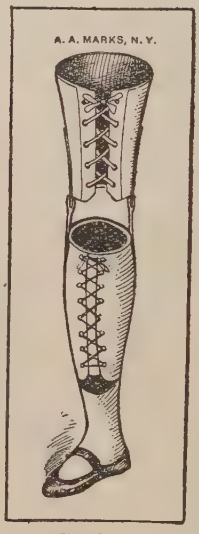
received into the socket of the artificial leg and held there comfortably. A rubber foot, with spring mattress placed at the required distance to restore length, fully equipped the child with means of locomotion.



Cut K 19.

Cut K 20.

Cut K 21.



Cut K 22.

Cut K 23.

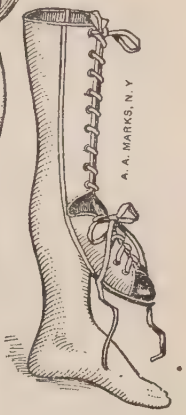
Cut K 21 represents a right-leg deformity; hip, thigh, and knee under normal conditions; the leg from the knee down undeveloped, foot very small, terminating in a great toe growing from

the internal side. Cut K 22 shows an artificial leg devised for the case. The deformed leg is received in the socket and laced. The toe is provided with a protecting pocket, the weight is taken partly on the plantar surface of the miniature foot and partly about the leg below the knee and about the thigh. When first applied the leg only reached to the knee, but it was found that there was a weakness in the knee, with a tendency to abduct; knee joints and thigh support were added, which prevented yielding to lateral weakness. Cut K 23 shows the leg applied and the child standing. Since the application of the appliance the child has

Cut K 24.

Cut K 25.

Cut K 26.



Cut K 27.

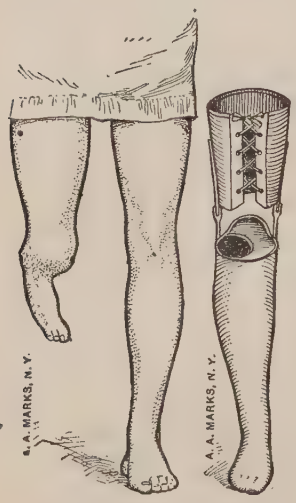
grown rapidly in stature and weight, well developed, strong and healthy.

Cut K 24 represents a congenital deformity of the right leg, consisting of a malformed foot, miniature leg, and abnormal relations of tibia and fibula. The tibia extends to the ankle, without connecting with the foot. The fibula connects with the foot but not with the leg, the two bones held in position by cartilage. When standing on the right foot the bones would slide by each other over an inch; there was also lateral weakness, rendering walking impossible without assistance. Cut K 25 represents an appliance constructed for the case, made of aluminum formed to receive the foot and leg in a comfortable way, terminating with a rubber foot. The weight, when standing or walking, was placed on the internal sloping surface of the tibia, immediately below the knee. The socket held the tibia and fibula in position. This appliance has been used for many years, enabling the wearer to engage in arduous labors, and capable of walking great distances without fatigue.

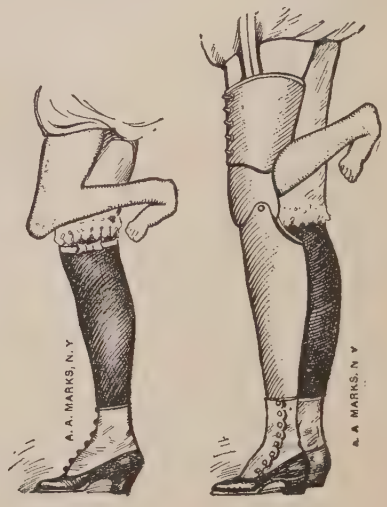
Cut K 26 represents a shortened and malformed leg. The shortening appears to have been located wholly in the leg between

the knee and ankle. Cut K 27 represents a suitable leg. It is constructed to receive and hold the deformed member firmly in place. A rubber foot, placed under the foot-rest, gives the required length. The motion in the ankle made it possible to drop the toe to a concealable angle. Although the apparatus had the appearance of a double foot, there was no difficulty in concealing the deformity by the trousers.

Cut K 28 illustrates a deformity of the right leg. The hip and thigh are normal and an undersized foot appears to have grown



Cut K 28. Cut K 29.



Cut K 30. Cut K 31.

immediately from the knee. The patient was able to flex and extend the foot the same as a leg, or, in other words, he had an articulation at the junction of the thigh and the foot, the tibial section being absent. Cut K 29 represents an artificial leg devised for the case. It is similar in its general construction to that represented in Cut E 17. The socket of the leg is excavated to receive the foot, the knee joints and thigh supporter give the foot control over the artificial part.

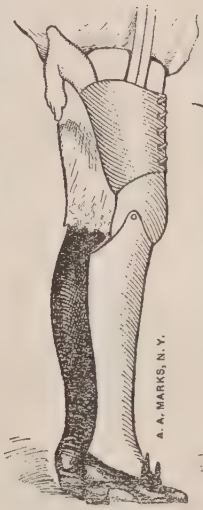
Cut K 30 represents a deformed left leg. From the knee down it was misshapen, contracted, and distorted. Cut K 31 represents a suitable artificial leg applied. The deformed parts were placed well up and out of the way, concealed by the dress.

Cut K 32 represents a deformed lower right leg, very similar to the one just described. The knee, however, admitted of more flexion, and the artificial leg was made to receive the thigh and deformed part in one socket and was held in place by means of a leather sheath passing from the rear and lacing to the front line of the thigh, as shown in Cut K 33.

Infantile Paralysis.—Cut K 34 represents an undeveloped left

leg, the entire limb considerably atrophied and the joints weak, caused by infantile paralysis. Cut K 35 represents an artificial leg especially designed for the case. The deformed leg is received in the socket and laced in place and the foot dropped to the greatest angle of toleration. The thigh piece incases the thigh

Cut K 32.



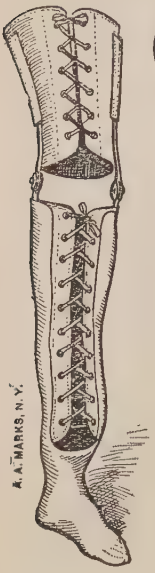
Cut K 33.

Cut K 34.

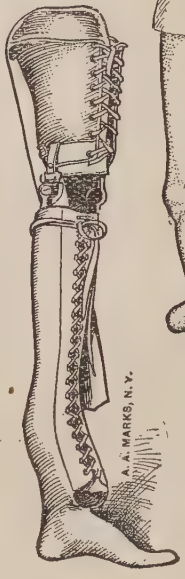
and the joints support the knee; a rubber foot is placed at the extremity. Cut K 36 presents a side view of a similar appliance with a knee lock, which is necessary in cases of loss of control in the joints.

Cut K 37 represents a deformity of the right leg; the hip, thigh, and knee normal and healthy, but the leg and foot diminutive in size, with foot rotated outwardly. Cut K 38 represents an artificial limb especially devised for the case. The undeveloped leg is received into the socket, the foot protrudes through an aperture on the external side, the knee joints and thigh piece, placed above the knee, give support and strength about the thigh. A rubber foot, with spring mattress at the lower extremity, completes the apparatus and gives the required support.

Obstructed Growth.—Cuts K 39 and K 40 represent cases of obstructed growth, the hip joints normal, the thighs possessing nearly the proper lengths, terminating in short and misshapen legs. Cut K 41 represents a leg suitable for either case. Both these persons were enabled to walk nearly as well as if normal conditions existed. A slight enlargement of the trousers a little above the knee (necessary to accommodate the deformed leg) is the only noticeable difference in the two sides, and that difference so slight as to be observed only by the critical eye.

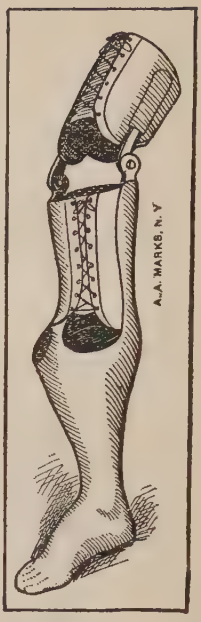


Cut K 35.



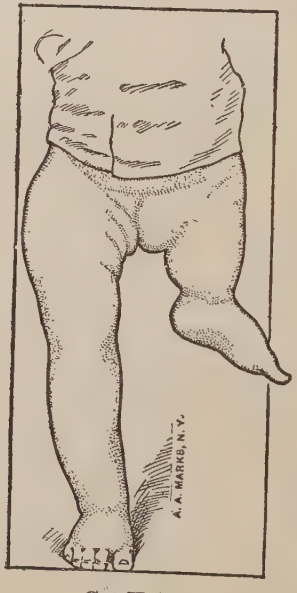
Cut K 36.

Cut K 37.



Cut K 38.

Cut K 39.



Cut K 40.

Cut K 41.

Cut K 42 represents a deformity consisting of an undeveloped femur and partially developed leg, the knee joint located very

close to the hip. A suitable artificial leg is shown in same cut. The wearer walks so perfectly with this leg that his deformity is absolutely concealed.

Both Legs Deformed.—Cut K 43 represents a deformity, both legs atrophied, talipes-varus, feet abnormally large. Amputation of both feet at the ankle joint after the Symes method was advised. This was done and the patient obtained a pair of legs, on which he walks and performs labor acceptably. Cuts K 44 and K 45 represent front and side views of a deformity of

Cut K 42.

Cut K 43.

both feet. From the hips to a little below the calves normal conditions were present; at about the calves there were false joints supplementary to the knee and ankle articulations. These false joints were under poor control, not sufficient to hold the feet in proper position. We advised the amputation of both limbs through the false joints. This was done, and the child had two excellent tibial stumps on which artificial legs, style E 17, were applied and worn with comfort and efficiency.

Cut K 46 represents a case of amputation of right leg and talipes-varus in the left. A suitable artificial leg for the right side and a helpful appliance for the left are shown in the same cut; Cut K 47 shows the limbs applied and the wearer standing erect. The disposition of the leg to rotate inwardly was controlled

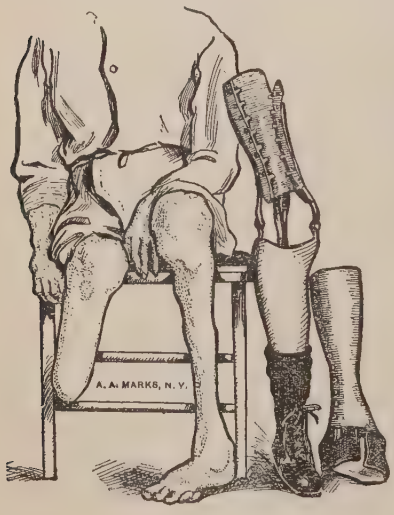
by the appliance and the leg was compelled to operate in the line of progress.

Cuts K 48 and K 49 represent front and side views of a case

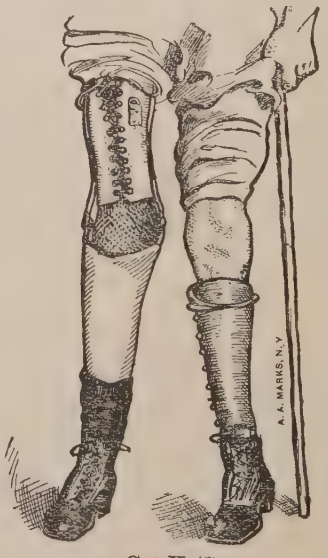
Cut K 44.

Cut K 45.

of congenital deformity of both legs, rendering walking very difficult and more largely dependent upon crutches than on feet. We advised the amputation of both legs at the calves. The subject



Cut K 46.



Cut K 47.

submitted to the amputation of the right leg, but decided to retain his left, which appeared to have more sustaining power. Cut K 50 represents the case after the amputation of the right leg, and

Cut K 51 represents him with the artificial leg applied, while Cut K 52 shows him dressed. The condition of the wearer was greatly improved by the removal of the right leg and the application of

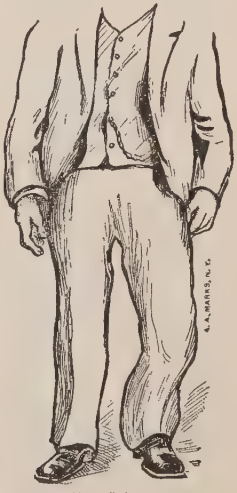
Cut K 48.

Cut K 49.

an artificial one. The improvement would have been carried further if he had submitted to a similar operation on the left side, thereby obviating the outward curve of the lower leg, which

Cut K 50.

Cut K 51.

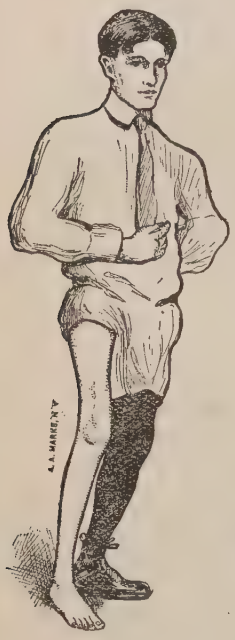


Cut K 52.

is conspicuous even when covered with trousers. Cut K 53 represents a case of paralysis of the right leg, knee slightly flexed. Cut K 54 represents the same with one of our instruments

applied; wearer seated. It was constructed with knee joint, provided with automatic lock, preventing flexing with the weight directly over the leg, permitting flexion when the wearer is seated. The foot is held in proper position for standing and prevented from flexing treacherously when walking.

Cut K 55 represents congenital deformities of both legs; branches grew from the inner surfaces of both femurs. That on the right thigh was ten inches in length, on the left not more than two. The knee joints were on the inner surfaces of the ends of



Cut K 53.

Cut K 54.

the femurs, feet everted and badly formed. In boyhood, locomotion was obtained by moving about on his haunches; later he walked with the aid of crutches, bearing on the ends of his femurs and dragging the deformed legs. For twenty-five years he submitted to these awkward and unsightly means for getting about. His attention was finally called to artificial limbs, and upon consulting well-informed persons he found that he could improve his condition by having the useless parts of the legs removed and artificial ones applied. We indicated points at which amputations could be performed to advantage. After the operations his stumps presented the appearances shown in Cut K 56. We applied a pair of artificial legs, constructed on the plan of those represented in Cut G 8. When dressed, this man had the appear-

ance of a person with natural and well-formed legs. Cut K 57 is taken from a photograph, showing him as he appears in ordinary life.

Cut K 58 represents a case of arrested development. The child was well formed from the knees up, but from the knees down his deformity was pronounced and of a character to render walking

Cut K 55. Cut K 56. Cut K 57.

impossible. The child managed to get about rather awkwardly with crutches, permitting but little weight to come on his feet. As the joints in the ankles and knees were flexible, and as the feet were small, we found that we could incase the entire legs, provide knee motion, and place rubber feet at suitable distances below the deformed ones. This was done, and the lad was brought to his proper height, making a presentable appearance and walking in a very acceptable way, without the aid of crutches. He controlled the artificial knee joints by means of his feet and had little or no difficulty in balancing, walking, sitting, rising, ascending or descending steps. Attention was given to ornamentation, and when dressed his deformity was entirely concealed, as shown in Cut K 59.

Drop Foot.—The drop foot, resulting from paralysis or arrested development, is a frequent infirmity. Usually the leg is of normal length, the knee joints contracted and weak, with loss of control at the ankles and lateral weakness or a tendency for the foot to bend sidewise, either varus or valgus. The only practical manner in which a leg of this sort can be rendered useful is by fixing the ankle joint artificially, thus providing a resistance at the ball of the foot, the concomitant for balancing, maintaining height when walking and serving as a lever for propulsion, and as a counteracting influence to the tendency of the knee to flex. Cut K 60 represents a case of this kind. Cut K 61 represents the

Cut K 58. Cut K 59. Cut K 60. Cut K 61.

appliance we have devised for such. It is practically a form of splint, cast of aluminum to the shape of the leg and foot. The metal is carried under the entire foot, holding it at a proper angle for walking. The front is provided with leather, arranged for lacing. This appliance holds the ankle joint firmly and provides support at the ball of the foot, which is so far in advance of the center of motion of the knee that it prevents the knee from flexing when the weight of the wearer is directly over the foot. Persons with these appliances walk rapidly and quite naturally, seldom requiring any attachments above the knees.

In connection with appliances of this type for paralyzed lower extremities we may quote from the Cincinnati *Lancet-Clinic* of October 9, 1897. A prominent physician read a paper before the academy regarding the treatment of his own paralyzed leg:

"An illustrated catalogue fell into my hands, in which was pictured, among artificial legs, etc., an apparatus made of aluminum, splint-like in character, with a rubber cushion under the foot to compensate for shortening. It was made for a case of congenital dislocation of the ankle. The more I studied it, the

more it appealed to me that such an apparatus could be made for my own comfort. I had reached a period when I was considering amputation and the substitution of an artificial leg for my paralyzed one. Impressed with the illustration of this apparatus, I consulted a friend upon the subject. He was as much impressed with it as I was, but advised me to obtain the opinion of our surgical friends. They were likewise impressed with it and advised that I try the conservative measure first before I resort to the radical one. I went to New York and consulted the maker. After studying my deformity for a few minutes, he stated that an apparatus could be constructed that would materially improve my condition. The appliance was made and worn for four years. But those four years! How can I describe them? Pen and words fail me. It was like a beautiful oasis in a dreary desert of years of suffering. In connection with my deformity there was a weakness of the abductor muscles, which permits of a rotation outwardly of the thigh. This has been overcome by rubber abductor muscles. The one fastened to the outer side of the apparatus crossed the front part of the right thigh, crossing to the left side of the trunk, and is inserted into the harness. The one attached to the inner side of apparatus is inserted over the right posterior part of the harness, which is suspended from the left shoulder.

"Who are my benefactors? Who are those who have given to me the comfort of four years' duration, with a bright future of many more? And, within such a short period, free from pain, caused the twenty odd years of suffering to disappear in the dim and misty past?

"Oh, for a trumpet of such power to herald to the world their name, that those who are needy may seek them! But instead, in gratitude do I raise my feeble voice and wish the cup brimful of happiness for the firm of A. A. Marks, New York City.

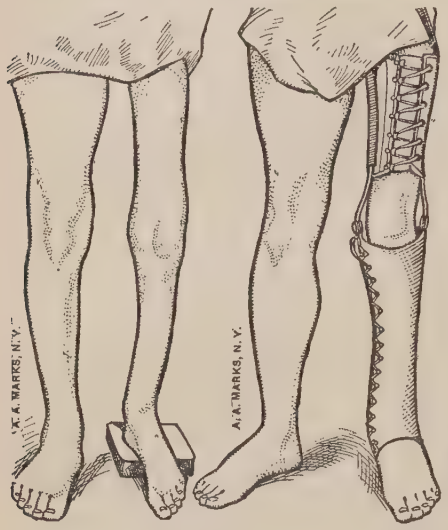
"'By thy deeds shalt thou be known!'"

Knee Joints Locked.—Shortened and paralyzed legs are frequently accompanied with total loss of the power of extension and flexion in the knee joints. In such cases the mechanism of the artificial knee joints is provided with locks that hold the knees rigid when standing or walking. The joints are capable of being unlocked to admit of flexion when sitting.

Cut K 62 represents a shortened, atrophied, paralyzed leg. Cuts K 63 and K 64 show the same case, with apparatus in place. The apparatus consists of a socket that incases the leg, knee joints with locks that support the knee, thigh piece that takes the support about the thigh, and a rubber foot placed under the deformed natural foot in order to obtain the proper length.

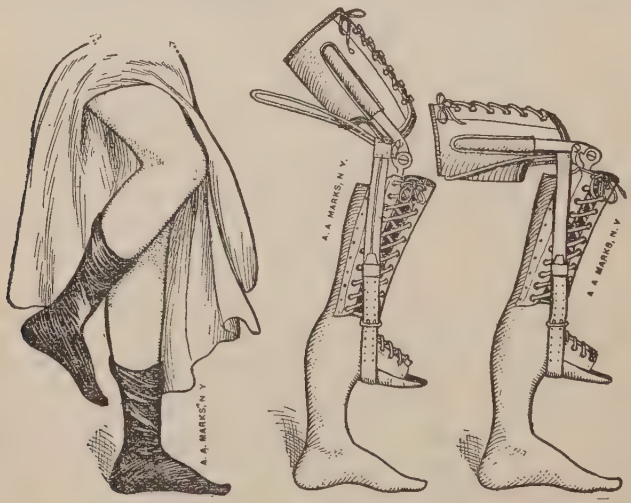
Limited Knee Motions.—Cut K 65 represents a shortened leg with limited motion in the knee, the knee capable of flexion, but incapable of extension beyond the angle represented in the cut; the hip normal and the bottom of the foot capable of enduring pressure. Cut K 66 represents an artificial leg suitable for the case. It is

made with a wooden socket, fitted to receive the leg. A comfortable shelf is provided for the foot to rest upon. Knee joints with pawl and



Cut K 62. Cut K 63. **Cut K 64.**

rack and thigh piece incasing the thigh are provided. The pawls at the knee joints are operated by levers which pass up the rear of

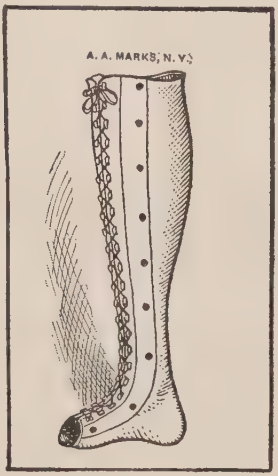


Cut K 65. Cut K 66. Cut K 67.

the thigh. When standing or walking, the leg is brought to the point of greatest extension, the pawls automatically drop into the rack and make the leg immovable at the knee. The moment the

wearer is seated, the lever will rest on the chair and force the pawls out of their racks, allowing the knee to flex (see Cut K 67). By this means the wearer is able to walk safely with rigid knee

Cut K 68.



Cut K 69.

and bend the knee when sitting. The apparatus has a rubber foot with spring mattress placed at the proper distance below the paralyzed one.

Ununited Fractures.—Cut K 68 represents an ununited fracture of the tibia and fibula at a point a little above the ankle joint. Usually, in cases of this kind, it is deemed advisable to amputate, the wisdom of which we do not question. Occasionally, however, and particularly in the case here illustrated, the horror of the knife kept the patient from submitting to that alternative, and he came to us for help with a dangling foot, under no control whatever. He was young and in good health, and cherished the hope that if the fractured parts were held firmly in juxtaposition, nature might eventually, in her mysterious way, bring about a union. We constructed an aluminum socket, incasing the leg from the knee down and the entire foot, fixing the ankle. This appliance, shown in Cut K 69, was fitted when the tibia and fibula were in apposition. Weight was communicated from the bottom of the appliance to the leg immediately below the knee. No weight whatever was brought on the foot and no strains permitted to cause the bones to move out of the places in which they were held. The appliance has been worn advantageously for a number of years. The manner in which the wearer gets about, walks, and attends to his vocation is exceedingly gratifying.

Cut K 70 represents an ununited fracture of the right tibia, due to gunshot wound. All efforts to bring about a union failed. The fibula was not injured, but in consequence of failure of union in

the tibia it was obliged to do the work of both bones. Being overtaxed, it gradually yielded and became curved, as shown in the cut. The dark spot immediately below the patella represents a deeply indented scar at the point of fracture. Cut K 71 repre-

Cut K 70.

Cut K 71.

Cut K 72.

sents a suitable brace for the case, made of wood and leather. A block of wood is excavated to receive the fractured member in its most comfortable position. The leg, when placed in this splint-like appliance, is held firmly by means of lacing. As the injury shortened the leg about one inch, a block of suitable thickness was hinged to the lower extremity of the splint on which the foot rested. Owing to the proximity of the fracture to the knee articulation, it was impossible to construct the brace that would admit of knee motion. The appliance has done its work for a great many years with great satisfaction to the wearer.

Fractured Knee Caps, etc.—Resections of knee joints, fractures of knee caps, weakening of the patella ligaments, in fact any ailment that lessens or destroys control over the knee articulation is greatly benefited by appliances similar to that represented in Cut K 72. The socket below the joint is made of wood, with a leather front capable of being laced. The upper socket is made entirely of leather. The knee joints are made with stops, so that extension cannot be made beyond the proper limit. In cases of partly flexed knees, due to knee-joint disease, this appliance can be used to advantage, requiring knee locks in addition.

CHAPTER XII

FACTS FOR CONSIDERATION

Wooden Feet Substituted by Rubber Ones.—Artificial legs, manufactured with wooden articulating feet, are more or less troublesome and expensive to keep in order, and are deficient in supplying the requisite propulsive power in walking, it is therefore often deemed advisable to remove them and substitute rubber ones. We have devised methods by which this can be done, whether the legs be constructed of wood, leather, or metal. Our charge is $20.00 in each case. We guarantee the attachment to be strong and lasting. A foot of any size or shape to meet the wishes of the wearer can be put on, and the leg can be made longer or shorter, as may be desired.

A Way to Test the Rubber Foot.—The attachment of a rubber foot to an old artificial leg is often done to test its merits. It gives an admirable opportunity for the wearer to try the rubber foot and ascertain for himself the advantages it has over those he has worn.

An experiment of this sort can only be successful when the socket of the old artificial leg fits correctly; if it does not, the leg cannot be worn comfortably and satisfactorily, no matter what kind of a foot it may have.

A cabinet maker, carpenter, or other mechanic, be his skill in his own line what it may, should not be expected to connect a rubber foot to an artificial leg with assurance of satisfactory results. The alignment, the set of the foot, the angle at which it should be placed relative to the shaft, are important factors and must be thoroughly understood and their relations to each other comprehended, or the results will be disappointing. This knowledge can only come from experience; we therefore dissuade persons from buying rubber feet and having them put on their artificial legs by home mechanics. We therefore insist that artificial legs be sent to us for such work, and for which we make no extra charge.

Ease and comfort in wearing an artificial leg depend almost entirely upon the manner in which the socket receives the stump. No matter how correctly the leg may be constructed, or with what nicety the parts operate, it is worthless if it causes pain, abrades the stump, or interferes with the circulation.

Fitting—an Art.—The fitting of an artificial leg is an art, only acquired by thought and the experience of years. A thorough knowledge of the anatomy of the stump, the effects of pressure

on various points, the manner in which interference with the circulation or the displacement of tissues on the stump can be obviated must be understood, or the fitter is not qualified to be intrusted with such work.

There are a great many artificial limb manufacturers in the world, but there are a very few fitters.

Only One Way to Fit.—There is but one way in which a leg can be made to fit correctly, and that is to excavate a block of wood until it has the proper size and shape to receive the stump, so that pressure will be placed where it can be endured, there must be absolute freedom from contact on the blood vessels and exposed nerve areas.

A leg that puts pressure uniformly on the stump is not a comfortable one to wear, for there are many places on every stump that cannot bear any pressure whatever. There are other places that can endure any amount of pressure; a socket to be comfortable must, therefore, be made so as to apply pressure only where it can be endured.

When Plaster Casts are Useless.—A plaster cast of a stump and a plaster cast of the inside of a socket that fits the stump correctly are no more alike than the last on which the shoe is built is like the foot on which the shoe is worn. It is absurd to assume that a serviceable, comfortable socket can be made by molding a plastic material, such as leather, felt, or wax, on the cast of a stump or by molding it on the stump itself. Sockets so made are always irritating and cause pain and suffering. It is likewise an error to assume that a block of wood can be cut out to the contours of a plaster cast of a stump and fit the stump comfortably. If it were so, the fitting of an artificial leg would be reduced to a mechanical operation which could be conducted by inexperienced and inexpensive persons. If the work could be done in this way, the cost of an artificial leg might be considerably lessened.

Machine Fitting a Failure.—The irregular form turning lathe, with which all mechanics are familiar, carves a stick of wood to the exact shape of the model. Axe handles, gun stocks, shoe lasts, and many other articles are made in this way. A machine of this kind has been modified so as to excavate a block of wood so it will have the exact shape of a plaster mold of a stump. A socket for an artificial leg made in this way must be greatly modified by hand before it can be worn with comfort.

When we are reminded that the stump is bone covered with muscles, fat, blood vessels, nerves, tendons, and skin; that these coverings are not of uniform thickness: that they are soft, yielding, and easily displaced: that more pressure can be applied on the least sensitive parts, and that where the nerves and blood vessels are the most numerous less pressure can be endured, we will readily see that a socket, to fit properly and not injure the stump, must be fitted by persons skilled in the work, who know the location of the large blood vessels, the character and disposition of the nerves,

and who are keenly alive to the necessity of avoiding pressure on the vascular parts. The skilled fitter does not always need the presence of the person who is to wear the leg he is fitting. Circumferences and diagrams of the stump will guide him in doing more accurate work than is possible for an incompetent fitter, though he be supplied with plaster casts, or fits directly to the stump.

When Casts are Necessary.—Plaster casts are desirable in some cases. They convey contours, locate irregularities, prominences, and tender spots on abnormal stumps, or on those that reach to the knees, ankle joints or insteps, and in such cases are quite necessary, but, generally speaking, stumps that extend to any point between the articulations do not require to be reproduced in plaster.

Wood Sockets the Best.—The advantages of wood sockets are many. Wood is light and firm, retaining the shape it receives from the skillful fitter. No matter what conditions may exist—the tender spots of a stump are always protected, weight is applied where it can be endured, and when the socket is highly polished there is absolutely no friction. A stump may move, slip, and slide without becoming blistered or abraded.

Weight.—The weight of an artificial leg varies from one to seven pounds, according to the size and the severity of the labor it is to perform. We have made artificial legs for infants that weighed less than a pound, and we have been obliged to make them seven or eight pounds in weight in order to be strong enough for active, three-hundred-pound persons. The only way to obtain strength is by the employment and proper disposition of suitable material. A small leg is not as heavy as a large one, and a strong leg must be heavier than a frail one.

Rubber Foot not Heavy.—A leg with a rubber foot can be made from six to sixteen ounces lighter than the ordinary artificial leg with articulating ankle. The lessening of weight is chiefly caused by the absence of the metallic ankle connection.

The notions of those wearing artificial legs are varied, therefore they cannot be used as guides. One man says, make my leg as light as you can, even at the sacrifice of strength; I would rather have a light leg and renew it more frequently than to carry a heavy one. Another will say, do not make my leg too light; I have worn light and heavy ones, and I find that I can walk more steadily and step more naturally with a leg of moderate weight. The leg should act as a pendulum; the moment it is lifted from the ground it should swing forward of its own weight and not depend upon energy imparted by the stump. Still another will say, I do not care what the leg weighs so long as it is made strong: strength is the desideratum. If it weighs a pound or two more I will not object to it, as I can soon get used to that, but it must be strong and last a long time. I cannot afford to take chances on the leg breaking. The utmost diversity of opinion, therefore, exists on this subject.

The greatest demand, however, is for the lightest leg, consistent with strength.

For light, delicate women, weighing less than a hundred pounds, a full-length leg weighing three pounds without attachments is as light as it is prudent to produce. So light a leg with ample sustaining strength is almost a marvel. We know of nothing calculated to withstand equivalent strains that weighs so little. A leg weighing six pounds for a large, heavy person, who is likely to subject it to severe use, is not excessive, and should not be objected to.

Let us think, for a moment, of the weight of other instruments that are made to stand similar strains. The weight of the bicycle has been reduced from sixty to nineteen pounds, and it is generally conceded that a nineteen-pound bicycle is as light as prudence will allow. Persons marvel at a bicycle weighing so little, yet the nineteen-pound bicycle has no more work to perform and is not subjected to any more strains than an artificial leg weighing from three to six pounds. The bicycle, like the leg, has only to support the weight of the rider and resist such strains as may occasionally be brought upon it.

In constructing a leg it is essential to make it strong enough to sustain the weight of the wearer and not break under such sudden strains as it is likely to receive at times. If one slips and recovers himself with his artificial leg, some part receives a strain that is much greater than the weight of the wearer. In ascending or descending stairs the strains on the leg are greater than in walking. A leg should be made strong enough to meet these demands, and, in addition, must have a margin of strength that will enable the wearer to carry such articles and lift such weights as his vocation requires. No matter how crippled one may be, or what his station in life is, nor how delicate, there will be times when he will thoughtlessly lift, carry, push, or pull some weighty object. Should the leg break under any of these conditions, the maker would unquestionably be severely censured.

It is not wise to build an artificial leg so close to the danger line, especially for delicate persons, that when those persons become healthier, stronger, and heavier the leg will break. Conditions do not remain the same. "The weak of to-day are the strong of to-morrow." The light person frequently becomes heavy, and the careful limb maker, if he guards his reputation, will keep well on the side of safety.

The average weight of a substantial artificial leg, suitable for a thigh amputation, worn by a man weighing one hundred and fifty pounds, engaged in an ordinary occupation, may be placed at five pounds, less for a below-knee or foot amputation.

It is possible to localize the weight of a leg weighing six pounds so that it will feel lighter than one weighing half as much, improperly adjusted. Inadequate means of attaching the leg to the body will make it feel heavy. A heavy lower part, with a light thigh piece, produces an apparently heavy leg, because

the weight is distant from the stump and the frail thigh piece does not hold it in place securely. On the other hand, a strong, substantial thigh piece, which properly holds the leg in place, will lessen the apparent weight considerably.

Odor.—The contention that rubber emits a disagreeable odor is untrue. Sponge rubber has no more odor than wood; moreover, the rubber foot is incased with an air-tight material. Even if the rubber had a disagreeable odor—which it has not—it would not be possible for it to escape. On the other hand, the ankle joints of articulating feet have to be oiled very frequently, and the oil in time becomes rancid. No refined person can possibly tolerate such an odor.

Temperature.—The rubber foot will not alter its consistency on account of changes in temperature. Properly vulcanized rubber, such as is used in the manufacture of our rubber feet, will not lose its elasticity in any temperature the human body is capable of enduring. It requires 280 degrees of heat (Fahrenheit) to produce a change in rubber, and as there is no habitable place on the earth with a temperature half of that, the rubber foot is never in danger from heat; no human being could live in a temperature intense enough to harden pure rubber.

The Mass of Limb Wearers are of Small Means.—The greater number of wearers of artificial limbs are in limited circumstances. It is exceptional to find a wealthy person in need of one. The wage-earner, the laborer, the man who works in the mill, the engineer, fireman, brakeman, or the miner, the private in the army, those whose occupations place them in jeopardy and who are exposed to the dangers that destroy life or mutilate the body, these make the greatest number of limb wearers. This being so, it is the more important that artificial limbs should be durable and as inexpensive to wear as possible. The first cost, the purchase of the limb, should be the only important item to be provided for. An artificial leg constructed with delicate machinery, or parts subject to friction, may be attractive to look at, but is ill-suited to the wants of the man who has to support himself and his family by daily toil. The loss of time in having repairs made, the cost of repairs, and the danger of breaking down at critical times, are serious matters, and the careful man will take them into consideration before making his selection.

We do not know an artificial leg with an ankle joint that is now made, that has ever been made, or, perhaps, ever will be made, that will not cost from five to twenty-five dollars a year to keep in repair. The delicacy with which an ankle joint must be constructed in order to be light and small enough for its narrow limits, and the immense strain that it must resist at times, are conditions incompatible with durable mechanism.

The fact that persons walk, run, and perform all kinds of labor on artificial legs with rubber feet without ankle motion is evidence that the ankle mechanism is unnecessary. Men, women, and children with rubber feet run, walk, skate, and dance. Work,

regarded not many years ago as impossible, is now being daily performed with facility. The farmer follows his plow on a rubber foot, the blacksmith works at his forge, the sailor climbs his rigging, the builder erects houses, and persons of every vocation attend to their affairs with as little concern and hindrance, operating on one or a pair of our rubber feet, accomplishing as much as their associates who are in possession of all their natural limbs.

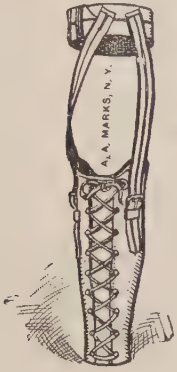
How Long Will a Leg Last?—The question is frequently asked, "How long will an artificial leg last?" There is but one reply: it depends upon the care the leg receives. We have patrons who are still wearing artificial legs that were made for them twenty-five years ago, and the legs still appear to be in fair condition. These are exceptional cases and should not be referred to, any more than should the experiences of those who, through abuse and carelessness, destroy their artificial limbs in an unexpectedly short time. An average made of the frequency with which our patrons renew their substitutes, fixes the period at about eight years. This does not imply that a leg will not last longer. Necessity by no means occasions all renewals; wearers want new legs much the same as they want new coats, before the old ones are completely gone. Wearers become as proud of their artificial limbs as they do of articles of apparel; those financially able frequently supply themselves with several, so as to have a reserve for emergencies. Accidents are as likely to occur to the substitute as to the real ones. Men have been run over by vehicles and have had their artificial legs crushed instead of their natural ones. When accidents of this kind occur, the limbs must be sent to the manufacturer for repairs. The wearer who is fortunate enough to have a duplicate which he can put on is at a great advantage. Taking all these facts into consideration, and fixing the average life of an artificial leg at eight years is certainly estimating on a fair basis.

Shoes and Stockings.—All artificial feet should be dressed with stockings and shoes, as are natural ones. The wear and tear on shoes and stockings, when the feet articulate at the ankles, are enormous and have been a source of complaint. This annoyance is removed by the use of rubber feet, for shoes on rubber feet look and wear like those worn on the natural, as the wrinkling at the toes and other parts is nearly identical in both. We have heard patrons say that in five years their rubber feet have saved them in the cost of stockings and shoes enough to buy a new leg.

How Soon after Amputation Should an Artificial Leg be Applied?—As soon as the stump is thoroughly healed and the patient has regained sufficient strength to go about on crutches, it is time for him to consider the matter of procuring an artificial leg. Before procuring one some attention should be given to the preparation of the stump.

Treatment of Stumps.—Tight bandages should be worn from

the moment the stump is healed until the artificial leg is applied. Bandages are inexpensive and can be frequently renewed. A very good and perhaps more convenient substitute is the stump corset; this is made as follows: A piece of substantial leather is molded upon a form made to the dimensions and contours of the stump, it is lined with suitable material, strengthened in the lower section with rawhide; after being applied it is laced as tightly as it can be endured. In addition to compressing the stump and bringing about a reduction, it becomes a means of protection, for, should the wearer fall and land on the amputated side, he would strike on the end of the corset and not on the end of his stump. These corsets are suitable for amputations at any point.



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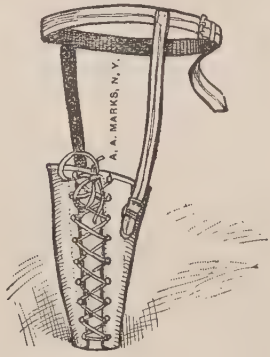


Cut L 2.

Cut L 1 represents one with suitable straps for leg amputation and Cut L 2 represents one for a thigh stump.

The knee and hip joints should be moved very frequently, and the stump rubbed vigorously in order to maintain mobility.

No matter what means are employed to reduce a stump before an artificial leg is applied, it is doubtful if all the changes can be brought about. As a rule stumps become smaller from wearing artificial legs. The pressure received from the socket has a tendency to force absorption and solidify the tissues. The extent of this emaciation cannot be conjectured. Some stumps do not change even when artificial legs are worn for years. On the other hand, we know many cases where the stumps have grown larger. The matter is governed by the disposition of the wearer, his occupation and his activities.

If a stump reduces after an artificial leg is worn, some compensative adjustment must be employed, lining the socket with thick material as leather, felt, or cloth, or by wearing a number of socks on the stump, one drawn over the other is the most convenient way, but in case of great shrinkage, so much so that such fillings are objectionable, it will be necessary to remove the socket from the leg and substitute a new and smaller one. We do this work

for our customers at small expense, but new measurements and diagrams are required and the entire leg must be sent to us.

If the stump is one that will yield to pressure it will not only become smaller under the influence of the bandage or corset, but must grow still less by the use of the artificial leg. Under such circumstances, it is an important economical question to determine whether it may not be wiser to immediately apply a leg and change the socket, should it become necessary, than waste time in bandages or shrinking corsets.

The Gain in Applying a Leg Immediately.—The immediate use of an artificial leg enables the wearer to dispense with crutches at the earliest possible moment, to gain the freedom of his arms, attend to his vocation, and take healthy and vigorous exercise. The cost of a new socket to fit a reduced stump is insignificant when the advantages of wearing an artificial leg during the interval the stump is changing are taken into account.

Walking on crutches is dangerous, a slip or fall may seriously injure a stump. An artificial leg is the best protective device for the stump.

The single exception to the wisdom of early applications is in amputations which result from malignant diseases.

Dangers in Delay.—If a stump is permitted to go for six months without performing its share of work, it will become weak, nervous, and disordered, and circulation will become sluggish. It is much more difficult to use an artificial leg on a stump that has been permitted to get into this condition than if applied immediately after it has healed.

We have applied artificial legs within a month after amputation with good results, although this time is exceptionally brief. It is impossible to indicate the exact length of time that should elapse between the amputation and the application; it is safe, however, to say that a limb can be judiciously applied as soon as the wound is healed, even if there be tenderness on the amputated surface. It is well to remember, in this connection, that with rare exceptions the end of the stump bears no pressure whatever.

It is a common error to assume that a stump will become hard and tough in time. Nothing can harden or toughen it except use, and there is no better way to toughen a stump than to use a leg. The hands of a laborer are strong and hard because he uses them in performing his work. Those of a person not accustomed to manual labor are soft, tender, and delicate, and become easily blistered because they have not been disciplined. Exactly the same principle is applicable to stumps.

Surgeons are at variance in their views on this topic. Some advise an early application, others insist on their patients waiting an unreasonable length of time. The surgeon who has studied the subject in all its bearings invariably agrees with the advice given above.

Cork Legs.—The term "cork leg" has long and frequently been

used to designate an artificial leg. The prevailing impression is that there is or has been an artificial leg made principally of cork. This is an error and should be corrected. Cork is known to every mechanic as a very friable substance, on account of which it has not strength enough to form any part of the supporting structure of an artificial leg.

The origin of the term "cork leg" is not known. It has, however, been said by credible authority, that the term originated from the fact that years ago very good artificial legs were made in Cork, Ireland, which were called Cork legs, the same as legs made in London are called London legs, those made in New York are called New York legs, etc.

There have been many doggerels written in which the word cork is used to designate an artificial leg.

Thomas Hood, in his Golden Legend, "Miss Kilmansegg and Her Precious Leg," speaks of cork and wooden legs, neither of which was good enough for the fastidious Countess:

> "She couldn't, she shouldn't, she wouldn't have wood,
> Nor a leg of cork if she never stood!
> And she swore an oath, or something as good,
> The proxy leg should be golden!"

It is evident that at the time the above was written, many years ago, the term "cork leg" was misunderstood the same as it is now.

CHAPTER XIII

ARTIFICIAL LEGS FOR THE AGED

To be deprived of a natural leg after having passed the allotted span of life is indeed a calamity, and the thought of wearing an artificial one is entertained with forebodings. Will not the infirmities of age come fast and heavy? Has not the shock sapped the vital reserve so that early decline will make the purchase an unprofitable one? Is the prospect of living a few years promising enough to justify the attempt? These are questions of gravity that come with force especially to those in moderate circumstances.

As is shown in another part of this book, the loss of a leg, no matter how old or enfeebled the patient may be, instead of hastening the fatal day, has a tendency to give a new lease of life. The removal of a diseased leg serves as a tonic to the entire system. If the finger of death has been laid upon the foot, as in senile gangrene, remove the foot and the decay will cease.

Like cutting the dying limbs from an old tree, the vital forces will be more generously distributed among the remaining parts and the tree will take on new life.

It is no greater task to learn to walk on an artificial leg than to learn to use crutches, and as a matter of fact an artificial leg is much safer. To put an aged person in a rolling chair and deprive him of the health-giving walks is to invite disaster. The aged as well as young will rust out sooner than they will wear out,

Age must not be taken into consideration; as soon as the stump is healed an artificial leg should be obtained; in a very brief time the wearer will be able to get about without depending upon others. Walks in the open air and healthful exercise will be indulged in, and gratifying results will follow.

A few cases bearing on this matter may be cited:

The Rev. Edward Beecher, of Brooklyn, N. Y., brother of the famous Henry Ward Beecher, lost a leg by accident in his eighty-fourth year. For several years prior to that time there were evidences of senility, and when he met with his accident it was not supposed he had vitality enough to survive it. Amputation, however, was proceeded with. Mr. Beecher recovered from the shock, and in a very short time was convalescent. He was soon able to take short walks on crutches, but the fear of falling made the task difficult and exhausting.

The writer well remembers when he was summoned to this distinguished clergyman's house. He was seated in a chair, looking very tired. He had just returned from a walk on crutches. "I am a very old man," he said, "and I do not think I have long

to live. The idea of buying an artificial leg appears to me a piece of folly; but my friend, Mr. Sage, is insistent that I should get one and try it. Whether I succeed or not, it will make no difference to you, but considerable with me. If I ever learn to walk on the leg I know I shall feel better, and I am going to try."

The leg was made and applied, and in a very brief time he acquired the art of walking on an artificial leg. He moved cautiously at first, but soon got so that he could put entire confidence in the limb. He took long walks daily, and attended to his church and parish work with renewed vigor. The leg was much easier for him to walk on than crutches, and gave him a feeling of security. He wore it for eight years, when he died at the age of ninety-two. Is it reasonable to assume that, if Mr. Beecher had not applied an artificial leg, but had resigned himself to the cot or rolling chair, he would have lived to that ripe age? Did not the walking that he was able to do, and the open air exercise, contribute to his health, and add to his life? The denial of an artificial leg would certainly have been a severe punishment to this good man for having lost his leg in old age.

Charles Van Brunt, of Long Branch, N. J., had his foot amputated on account of senile gangrene when he was seventy years old. An artificial leg was applied as soon after the amputation as prudence admitted, and he lived for fifteen years and wore the leg constantly. He died at the age of eighty-six. During much of the time he performed the duties of school janitor.

George Hinman, New Haven, Conn., had his leg amputated when he was eighty years old. He obtained an artificial one and wore it continuously for four years, during which he was active on his feet and walked long distances.

Mrs. Susanna Brown had her leg amputated above the knee when she was seventy-three years of age, a result of an accident. An artificial leg was applied four months after the amputation. She wore it three years and was active in domestic work. Dr. A. L. Britten, of Athens, Ill., writes about this case as follows:

"Mrs. Susanna Brown, of Cantrall, Ill., for whom you manufactured an artificial leg after she had passed her seventy-third birthday, found it eminently satisfactory. She was helpless in no sense. She could, and did, ascend and descend stairs without assistance, and without fear of falling."

David Penfield lost his leg on account of gangrene when he was seventy-two years of age. Dr. White, of Franklin, N. Y., in one of the letters says of the case: "The facts in regard to David Penfield are briefly told as follows: He was in the seventies when I first saw him, and had had two attacks of cerebral apoplexy, which left one arm and one leg paralyzed to such an extent as to make walking and use of arm impossible. Gangrene presented itself and I amputated the foot of the affected leg. He recovered, and I obtained an artificial leg from you for him. He very soon learned to use it, and was able to walk about fully as well as before

his trouble. He lived a considerable time after he obtained the leg, and found it a source of great comfort. His family and I regard the wearing of the limb as having added to his comfort and health."

Nelson Stevenson, Salem, Ind., had his leg amputated above the knee when sixty-seven years of age. An artificial leg was applied a few months later, which he wore for over three years.

Frederick Triebold, St. Paul, Minn., had his leg amputated above the knee when seventy-four years of age (in 1894). An artificial leg was applied eight months after the amputation which he is still wearing (1905). Dr. A. H. Steen, in writing of the case, says, "Frederick Triebold considers the artificial leg made for him indispensable, his health is good, and he wears the leg at all times."

Russell Perkins lost his leg in 1894, when he was sixty-nine years of age. An artificial leg was applied within eight months. Dr. William R. Lough, of Edmeston, N. Y., says, "Mr. Perkins gets along well with his artificial leg. He does his chores around the farm, and frequently comes to town. He does not use a cane and gets along very well."

James R. Bugbee lost a leg when he was seventy-six years of age on account of a fall. He had an artificial leg applied, which he is still wearing with great comfort. In one of his letters he says, "I am now seventy-nine years old. I am able to do my work around the house and garden, which I positively could not do with crutches."

William P. Hiller, of Nantucket, Mass., lost a leg in the Civil War. He is still living, and has worn an artificial leg continuously since. He is now eighty-two years of age.

Mr. Bradford Beal had his leg amputated in 1894 at the age of eighty-three. The leg was applied the following February, and he wore it with comfort and relief for over five years. We quote from a letter: "I am wearing the artificial leg constantly. I go about the house without cane or crutch. I have walked a mile from home and back a number of times without fatigue."

Equally encouraging reports can be given of hundreds of similar cases.

CHAPTER XIV

ARTIFICIAL LEGS FOR INFANTS AND CHILDREN

The Problem Considered.—It is a serious problem that confronts the parents of a child who has had one or both legs amputated. The parent, in happy possession of all his limbs, realizes more keenly than the child the misfortune that has happened. An artificial leg is, no doubt, the immediate and only remedy that can be suggested, but even this presents thoughts of expense for remodeling, and the question is often asked if the benefits will justify the costs incurred, and whether it may not be better to wait until the child has obtained his growth, before equipping him with the needed limbs.

A child, however young, is as greatly disabled by the loss of a leg as an adult. If one leg is lost he becomes dependent on crutches; if both legs are lost, he has to be carried in the arms or pushed about in a rolling chair, or is obliged to hitch himself about on his haunches as best he may. Such methods are at once unnatural and objectionable; they have a hurtful effect on the physique of a growing child, as well as harming the limbs, stumps, and joints. Walking on a pair of crutches for any length of time pushes the shoulders forward, settles the neck in the chest, and the spine fails to develop the sustaining strength demanded in later life.

Walking on one crutch, as most children do, cants the body sidewise, elevates one shoulder above the other, tilts the pelvis, and produces an over-development of one side of the body at the expense of the other. If the use of crutches is continued throughout the growing period, the disproportions resulting from unequal development will bring troubles that will last through life and imperil health. The stump, being pendent from the body and performing no functions, will become poorly adapted to the use of an artificial leg. The muscles will become atrophied, the joints enervated, and the range of motion lessened. It will be troublesome to wear an artificial leg under these conditions, and the task of disciplining the stump will be more difficult. It is doubtful if the harm thus done can ever be righted.

We can cite many cases where the neglect to apply an artifical leg to a growing child has been the cause of physical weaknesses that have been impossible to correct. Contracted hips and knees, weakened spines, deflected and rotated stumps, are a few of the many ills that have been traced to this neglect.

Failure to apply artificial legs in double amputations is

attended with more serious consequences. The stumps are held in flexed positions and subjected to such unnatural influences that the wearing of a pair of artificial legs, when undertaken later on, is greatly hampered. The art of balancing is forgotten and has to be learned again. The hip joints, having been in flexed positions during the greater part of the development period, have become more or less set, and extension is difficult and painful when the erect position is attempted.

Support from the Pelvis More Natural.—An artificial leg applied to a child, no matter how young, supplies a support to the amputated side that is the nearest approach to nature. It gives freedom to the arms, the joints and muscles are kept in activity. Being propped from the pelvis instead of from the shoulders, the spine, chest, and shoulders are not distorted, but are as free to perform their functions as if the child had never lost a limb. All the parts of the body maintain their proper relations and develop symmetrically.

The child invariably becomes expert in the use of one or a pair of artificial limbs, if applied soon after amputation; he mingles with other children, and engages in the same sports and exercises, the variety, which makes him strong mentally and physically, keeps him healthy, and prepares the foundation for the vigorous manhood and active life before him.

Alterations for Growth.—A child will outgrow his artificial leg, but this does not entail a serious loss; the leg can be altered in length and size to accommodate his growth and development. The expense attending such changes is not large, no greater than that of changing or renewing crutches, or repairing rolling chairs.

The only growth of the child that affects the length of the artificial leg is that which takes place in the sound leg from the knee to the floor. A child may, in the course of two years, grow four inches in his entire height, but the growth in the sound leg, from the knee to the floor, will be less than an inch. It is, therefore, evident that a child growing four inches in height will not require his artificial leg to be lengthened over an inch.

Frequency of Alterations.—The frequency with which an artificial leg worn by a child is lengthened, is about once in two years, oftener if the growth is more than usually rapid, and the expense attending each lengthening is not over $5.00. In families where economy has to be exercised to an extreme degree, the lengthening of the leg can be deferred, if necessary, by increasing the thickness of the sole and the heel on the shoe worn on the artificial foot as soon as growth requires. The size of the leg can be increased, and the foot can be enlarged, and in this way the leg can be made to last from five to ten years. It will thus be seen that in extreme cases a child can be supplied with an artificial leg, and the leg can be kept in proper length, at an expense of about $2.50 a year. We can hardly conceive of a parent who is so poor that he cannot meet this expense, or who

is so heartless that he would see his offspring hobbling about on crutches during his youth merely to save so small an expenditure.

The Parents' Moral Obligation.—Duty is the most important matter to be considered. All parents are bound by the laws of nature, as well as by those of the State, to perform those services that will protect the health and comfort of their offspring, to care for them in sickness, to lessen their afflictions, and alleviate their sufferings. It seems a flagrant violation of these laws for a parent to require his child to go on crutches, subjecting him or her to the dangers of impaired health and arrested development, when an artificial leg can be easily obtained and cheaply maintained, a leg that will perform such important work in ameliorating the child's condition. An artificial leg should be regarded as indispensable, more important than fine clothing, and next to the food that is required to sustain life. No conscientious parent, in viewing all the facts connected with this important subject, can hesitate in deciding on what course to pursue. If financial resources are limited, there should be no disgrace felt in calling upon friends for assistance; the urgency is too great to be neglected through scruples. The child must be rescued from a life of torture and embarrassment, and the parents must act to save themselves the censure and rebuke that neglect of this kind will bring in later years.

Deformities from the Use of Crutches.—Look at the child who is required to go about on a pair of crutches (Cut M 1).

Cut M 1.

Cut M 2.

Cut M 3.

See how the shoulders are pushed upward, how the head leans forward, the chest sunken, and how generally disfigured he appears. Look at the child who hobbles about on one crutch (Cut M 2), see how one shoulder is raised higher than the other; how

the body is thrown to one side, the sound leg deflected, the neck crooked. Now, look at the child who has been cared for humanely (Cut M 3), who has been given an artificial leg and propped in a natural way on the amputated side.

He is the picture of symmetry, his health is robust. No one would suspect that anything unusual had occurred to him, his artificial leg performs the functions of the lost one. He has forgotten his loss, and never admits his disability. He does everything his companions do; he is in the ball game with them, he rides the bicycle, skates, dances, and is not denied a single privilege belonging to those in possession of their natural extremities. "To clinch the nail of theory with a few blows from the hammer of experience" we cite a few cases that have come under our observation.

Practical Illustrations.—Cuts M 4 and M 5 portray Mabel T., who, when less than nine months old, had her left leg ampu-

Cut M 4.

Cut M 5.

tated very close to the knee. After recovering from the operation, it was discovered that the tendons of the knee were contracting and the stump being drawn into a flexed position. The mother became alarmed and consulted her physician. It was feared that if the child was permitted to continue as she was, she would, in a short time, lose the use of the knee joint. She had not begun to creep. It was evident that if an artificial leg were applied, the stump would be forced into such activity that the knee mobility would be preserved, and one was obtained. The

socket was made to fit the stump snugly, the joints were placed on the sides to harmonize with the natural knee joint; a thigh piece incased the thigh. The leg would swing when the child was carried, and forced the stump to move at the knee.

In a few months the child began to creep. The mother was surprised one morning to find her standing by the chair, putting some of her weight on the leg. It was not long before she began to walk, then to run and play. The leg was lengthened quite frequently, and enlarged several times. During her childhood she ran and romped about as other children, went to school, and was as happy as any of her companions; she is now a young lady of twenty-two. Although her parents were in moderate circumstances, they always felt that their daughter's health and perfect development were important, and they denied themselves many things, but considered themselves amply compensated for the care they had given to the needs of their daughter.

Carrie K., when seven years of age, was run over by a carriage and lost her left leg. An artificial one was applied as soon as the stump had healed. The distinguished Dr. James Knight, the founder of the Children's Hospital in New York City, took the case in hand, and realizing the importance of putting the child on a leg instead of keeping her on crutches, interceded in her behalf. A leg was applied and she grew up with it; she developed gracefully and now is a woman of forty-three years. Cut M 6 represents her as she appeared when brought to us in 1869. Cut M 7 represents her with artificial leg applied, and Cut M. 8 gives her as she appears to-day, a thankful wife and a happy mother.

Thomas Kehr, when eight years of age, was run over by the cars, both of his legs were crushed, the right was amputated four inches below the body, and the left two inches below the knee. As soon as the child recovered from the operation Dr. Samuel J. Brady, of Brooklyn, advised that he be provided with a pair of artificial legs with rubber feet. They were obtained and applied, and the manner in which the young man got along is clearly stated in Dr. Brady's letter of 1876, from which we make the following extract: "I have thoroughly examined the case of the boy Thomas Kehr, who has been wearing a pair of artificial legs for six months. About a year and a half ago he was run over and both of his lower limbs were so crushed that I amputated them, the one well above the knee, the other an inch and a half below. At the time of the operation many expressed the wish that death would occur, as the lad being very poor, it was thought that his future would not only be a burden to himself, but that his support, should he reach man's estate, would depend upon the charity of the public, as it was considered an impossibility for him to serviceably use artificial limbs.

"I am thankful that I can say that Marks' artificial legs have made his future worth the living.

"I saw him two weeks after he had put the legs on for the

first time, and it astonished me greatly to see the remarkable use he had so soon acquired; since then I have seen him many times, and quite recently I saw him walking without the use of canes. He has, much to my astonishment, been fully and absolutely restored.

"I attribute the wonderful success in this boy's case mainly to the superior results achieved by your inventions, and to the

Cut M 6. Cut M 7. Cut M 8.

fact that the legs were put on so soon after the amputations that the stumps had not had a chance to forget their functions."

Mr. Kehr is now a man of forty years. He is an active, capable, energetic workman, in perfect health, earning his livelihood and maintaining a family. If this man had been neglected in his childhood, he would be to-day a helpless object of pity, instead of a self-supporting member of the community,

Annie L. Beckwith lost her leg below the knee in 1887, when she was seven years of age. An artificial leg was immediately applied. It has been lengthened several times since. She is now a woman of good proportions, strong and healthy. Cuts M 9 and M 10 represents her as she appears without and with her artificial leg.

Manuel Parraga, of San Salvador, Central America, had his leg amputated above the knee in 1876, when eleven years of age. An artificial leg was applied immediately. His weight at the time was seventy-five pounds. The lad has developed into a full-

grown man, weighing two hundred pounds. He is strong, healthy, and has a model stump, and walks about in the most natural way. In a letter recently addressed to us he says: "For a long time I have been desirous of writing to you and expressing my continued satisfaction in the work that you have done for me. Since I have returned to Central America I find it necessary to make long journeys on horseback. The artificial leg assists me very much. I pride myself on my easy and graceful movements, and the facility with which I mount and dismount. The India-

Cut M 9.

Cut M 10.

rubber foot on the artificial leg is a most excellent invention; without it I question my ability to walk with safety in this country, where the streets are so rough and stony."

John Jerome Booth, son of Dr. J. P. Booth, had his leg amputated when seven years of age; railroad accident. An artificial leg was applied when he was eight years old. He then weighed fifty-seven pounds. The young man has grown and developed symmetrically and is now twenty-four years of age. He refers to the early application of his artificial leg as an exhibition of good judgment on the part of his father, for which he feels greatly indebted. He says that if he had been neglected when he was young, he would not be in possession of his present strength and proportion.

George G. Griswold had the left leg amputated below the knee when twelve years of age. An artificial leg was applied

within a year after amputation. We quote from a letter written by his father. "The leg was applied to my son when he was less than thirteen years old, fitted from measurements without requiring his presence, has been in constant use. I hardly know of anything that he cannot do that other boys of his age can with sound limbs. He walks, skates, plays ball (Cut M 11), and

Cut M 11.

climbs trees. When he was sixteen years of age we moved to another town, and for about a year scarcely a single schoolmate or neighbor ever suspected that he wore an artificial leg. I do not think it is possible to find an artificial leg equal to that which you construct for young and growing children. I have never regretted having applied an artificial leg to my son on account of his tender age."

William T. Wilson, when fifteen years of age, was run over by a railroad car and had his leg mangled so greatly that amputation was necessary. A few months after an artificial leg was applied. He weighed one hundred and ten pounds, and was at the period of life when growth and development promised to be rapid. The artificial leg was lengthened twice in four years.

James Good, at the age of thirteen, was run over by the cars and the left leg amputated below the knee. Seven months after amputation an artificial leg was applied; age fourteen, weight eighty pounds. The boy has grown to a man of large proportions, and at this writing is a locomotive engineer.

George W. Sheridan, son of General George A. Sheridan, was thrown from a carriage by a runaway horse, when he was ten years old. One leg was crushed and had to be amputated below the knee. Nine months later his mother, becoming solicitous about the child's development, insisted on an artificial leg being obtained, this in opposition to the advice of her husband and family medical adviser. The mother gained her point, and a leg was applied, and the child used it immediately, and the effect upon his health was surprising. We quote from the General's letter: "My son is now fifteen years of age. He has worn a leg of your make for the last five years, always with comfort and satisfaction. When visiting him at his school a while since, I found he was out for a day's fishing. When he returned and stated where he had been, the teacher remarked that he had walked at least ten miles. George skates on steel or roller skates, rides a bicycle, and in short enjoys to the full the usual sports of boys of his own age. I now realize that it would have been a mistake, almost a crime, to have made the boy wait until he had stopped growing before supplying him with your artificial leg."

Hattie L. Moore had her leg amputated at the age of thirteen. Six months after the operation an artificial foot was applied. She wore it five years without lengthening. The growth of the natural foot, from the ankle down, was not great enough to require any alteration in the artificial foot. We quote from her letter: "My foot was amputated when but a child of thirteen, and as soon as the stump had healed, I had one of your admirable rubber feet supplied, made and fitted from measurements. It fitted me as if I had gone to New York and had had the foot fitted by your own hand. I have used the foot four years now, to the untold satisfaction of myself, and the utmost gratification of my friends, who often tell me that they would never notice anything peculiar about my walk. I have lived with people nine months without their discovering that I was lame.

"I am at present doing a daughter's part of housework, standing on my feet the greater part of the time."

William E. Shaw, leg amputated for injury to the knee. An artificial one was applied when nine years of age. To quote from his father's letter: "My boy has had great success with the artificial leg that you made for him. He can walk and get about excellently. He would not be without it for anything. It is unquestionably the best thing for a child, when he has lost one of his legs, to get an artificial one without delay."

John Kershaw, leg amputated above the knee, railroad accident. Artificial leg applied when ten years of age, immediately after the healing of his stump.

Dr. A. C. Dedrick writes: "I passed John Kershaw in the street three months ago. From the success in his case I certainly advise the application of an artificial leg to a young and growing lad as soon as the stump has healed. John Kershaw has been able, thanks to the artificial leg, to enjoy his early life equally

with others not so unfortunate. He plays football, baseball, and all other sports. I think he would have lost all power of stump if the leg had not been employed. The stump is only about six inches long, and would in all probability have become flexed if he had grown older without a leg to keep the hip joint in condition."

Flossie Lee, leg amputated below the knee. Artificial leg applied when four years of age. Dr. G. A. Harris, of Chepachet, R. I., writes, "Flossie Lee has worn an artificial leg, which you fitted her five years ago, continuously since that time, except when sent to you for lengthening. It is needless to say that her health, in both mind and body, is different from what it would have been had she been confined to the house all these years. She has been to school, and runs about like other children, which means everything to a growing child. No change has been made in the leg all these years, except the increase in length."

Thomas McAleer, leg amputated above the knee on account of accident. Artificial leg applied when seven years of age. Dr. D. K. Dickinson writes: "McAleer, whom you so nicely fitted with an artificial limb for amputation above the knee joint, has received great satisfaction. I recommend the application of a limb by all means in similar cases."

Ettie Stangl, leg amputated below the knee in 1889. David Jones, of Richardson County, Neb., writes in regard to the case: "Ettie Stangl, to whom you applied an artificial leg when she was very young, has worn it continually. She does not appear like a cripple, she moves about so naturally. I can say that the artificial leg was a source of comfort to her, and I think providing her with the limb when she was so young was the best thing that could be done for her health and comfort."

Mary Wiley, both feet amputated in 1891; cause, railroad accident. Artificial feet were applied several months later. She was then eight years of age. This little girl is a forcible example of the wisdom of applying artificial limbs to children, especially when both are amputated.

Clarence Wintersgill, both legs amputated; right, six inches below, and left, three inches above the knee; cause, railroad accident. Artificial legs applied within a few months. Age, seven. Dr. R. F. Wintersgill writes as follows: "In regard to my son's case, the application of a pair of artificial limbs has been a wonderful success. He was but seven years of age when you made his limbs, but learned rapidly how to use them. He now skates, rides a horse, goes to school, and walks several miles without resting. I was advised not to get Clarence any limbs until he had ceased growing and had almost made up my mind to wait, but to look at my little child sitting out in the yard helplessly, and to think that he must do so until he had finished growing, made me almost frantic. In the meantime, one of my neighbors provided me with one of your books, and I studied it day and night until I came to

the conclusion to try a pair of your legs, with the results mentioned above.

"You will remember, Clarence's left leg is off above the knee and the right below the knee. He was wearing his artificial limbs one year after amputation, and if I had to do it over again he would wear them in one month."

John E. Palmer, leg amputated below the knee. Artificial leg applied within six months; age, nine years. His father, Bradford Palmer, writes: "I am glad to let you know what success my boy has had in using his artificial leg. He was only nine years old when he commenced wearing it. I can say that it has afforded him the greatest satisfaction, and he could in no way be induced to do without it. He is growing fast and has the best of health."

Anton Gaub, leg amputated in 1884. Artificial leg applied within a few months after amputation; age, four. Gaub is now (1905) twenty-five years of age, full grown and well developed. He has always used the leg and never cared for crutches. He is strong, in good health, and walks great distances without becoming fatigued. He is actively engaged in business. His parents refer with pride to their decision in putting him on an artificial leg when he was so young.

Roscoe E. Bosworth, leg amputated below the knee in 1890; age, nine years. His father, Levi Bosworth, of Worcester County, Mass., writes: "I consider that it was a very wise thing on my part to have supplied my boy with an artificial leg when he was so young. He now has full use of his knee and hip joints, which I think would have become greatly impaired if he had not used the leg. He is now in good health, well developed. Crutches, which he used for a short time, always made him sick.

"Roscoe has skated, ridden a bicycle, and done almost everything other boys do. If I had a child only two years of age and he needed an artificial leg I would put one on immediately."

Roy V. Bryant, leg amputated above the knee when seven years of age; artificial leg applied immediately. His father writes as follows: "My son has worn his artificial leg constantly, with the exception of times when it has been at your factory for lengthening. He is now twenty years of age. He has grown straight, strong, muscular, well developed. I am thoroughly convinced, from the experience in my own son's case, that an artificial leg cannot be applied when a child is too young."

Carl T. W. Banks, leg amputated above the knee; railroad accident; artificial leg applied within six months after amputation. His mother writes: "The question of applying an artificial leg to a young child was one of great thought to me. Many of my friends thought it unwise to do so, but I could not bear to see my son Carl going on crutches, so I got a leg and had it put on when he was only seven years old. He has been wearing it since, and he is now well developed, strong and healthy. During his childhood days he played with other boys, in all kinds of weather and at all kinds of games."

Emma Zern, leg amputated above the knee. Dr. J. William Trabert, of Annville, Pa., writes: "Emma Zern's leg was amputated in the lower third of the thigh in 1890, when nine years of age. She received an artificial leg from you within six months. She has been wearing the same constantly. In the following spring she grew 2½ inches. The leg had to be lengthened, but it did not cost very much to do it.

"At first I was doubtful that a child of her age should have an artificial limb, but am now convinced that a child cannot be too young, as this case has shown."

Nellie Cartwright, at the age of eleven, met with an injury to her leg that necessitated an amputation below the knee. Six months after an artificial limb was applied. Her father writes: "I purchased an artificial leg from you for my daughter in 1893. She was then eleven years old. She has used the leg constantly. I am delighted with the results and prepared to say that I recommend the use of artificial limbs to children of any age, and the sooner the child has a leg applied after losing a natural one the better it will be for that child. There are two reasons that should induce a parent to act promptly: First, an artificial leg enables a child to walk naturally, promoting good health and symmetrical growth. Second, a child becomes accustomed to the use of the limb while young and active and will ever afterwards use it with better results than it could if the use was delayed until maturity."

Clara Giere, leg amputated below the knee; age, eight. An artificial leg was applied immediately. Dr. E. Alonzo Giere, of Hayfield, Minn., writes: "The artificial leg which I obtained for Clara has given good satisfaction. The child has grown and the leg has had to be lengthened. She is still using it with comfort."

Dr. A. R. Eaton, of Elizabeth, N. J., under date of March 31, 1904, writes: "The facts of my case are as follows: In March, 1891, I had my left leg so badly crushed as to require a supracondylar thigh amputation (Gritti-Stokes type). In May of the same year I applied one of your artificial legs and wore it for a considerable length of time. Since I have attained my growth I have had another one made. The leg was a blessing to me from the start. As a matter of fact, I would have been lost without it at any time. I walk easily long distances, sometimes ride a bicycle, other times ride a horse; I play tennis, golf, etc. In fact, do with ease and facility almost all ordinary things.

"My observation leads me to believe that this excellence of locomotion is only possible with the Marks leg, for I see cases similar to my own using ankle-joint legs who are able to enjoy only ordinary usefulness.

"In regard to the application of artificial legs to young and growing children, I can say that my own case is an example. The artificial leg was applied when I was thirteen years old. I am now fully grown and am a physician engaged in active practice. My professional knowledge tells me that it is a most advis-

able procedure, for the use of a leg strengthens the stump, prevents atrophy of joint structures and soft parts, and trains a child in the use of a leg, and when he reaches adult life he will have perfect control over it, and he will become strong and healthy."

Charlie Moore, at the age of eight, had his leg crushed by a wagon. Amputation was above the knee. His mother writes: "My little son, Charlie Moore, when eight years of age, met with an accident that resulted in the amputation of his right leg. He went on crutches two years. He was pale and sickly and grew but little. The doctor said he was sure that the constant use of crutches would induce spinal disease or lung trouble. I therefore resolved to get an artificial leg for him. I did so, and as a result he now has good health, is well grown and thoroughly developed. I advise buying your make of artificial limbs for young and growing children. They are light and strong in construction and easily lengthened."

CHAPTER XV

HOME MEASUREMENTS

Our system, devised and inaugurated years ago, by which measurements and diagrams for artificial limbs can be taken at home by the family physician or the subject himself, assisted by some member of his family, and our method of fitting and constructing artificial limbs from such data, have proved so satisfactory that we encourage those desirous of saving long, tedious, and expensive journeys to have their limbs made from measurements while they remain at home.

This feature has placed our facilities and skill within reach of those who are in need of artificial limbs, no matter how distant they may reside from us; it affords an opportunity to obtain the best at the least possible expense and trouble.

So successful have been the results obtained from this method that expressions of gratitude and commendation have come from the most distant parts of the world. Men of prominence, as well as those not so frequently in public mind, have benefited by the plan.

We have customers living within a few miles of New York City who are so actively engaged that they prefer to have their limbs fitted from measurements under the guarantees we give, rather than absent themselves from their homes.

To encourage persons to have their limbs made in this way, we agree to make all changes or reconstructions without charge, whether such are required on account of errors in measurements or changes in stumps, or any other cause whatever.

If anyone desires to be present at the fitting, we will not dissuade him from his intentions, and will give him immediate attention on his arrival.

As soon as measurements and diagrams are received, we subject them to the closest scrutiny, and if errors or omissions are discovered, they are returned for corrections, and if there are any indications that successful fittings from measurements are doubtful we do not hesitate in notifying the party to that effect. As soon as we accept the data we assume all risks, we make the leg accordingly and forward it to the client with full instructions for its application. Should it fail to fit properly, it can be returned with particulars, and we will alter or reconstruct it without charge.

INSTRUCTIONS WHEN ONE LEG IS AMPUTATED

DIAGRAMS.—First, make a diagram of both the sound and amputated legs. This is done by removing the clothing and sitting

Cut N 1.

Cut N 2.

on a large sheet of paper, with both the sound leg and the stump extended and slightly spread apart, the foot pointed directly

Cut N 3.

Cut N 4.

upward. Beginning at the body, draw a pencil down the outside of the sound leg from the hip, around the heel and up the inner

Cut N 5.

Cut N 6.

side to the body. Then carry the pencil down the inner surface of the stump and around the outer side to the hip. Cuts N 1 and N 2 show the manner in which this is done if the amputation is

below the knee; Cuts N 3 and N 4 show the same if the amputation is in or above the knee. For side diagrams, it is necessary for the patient to lie on one side with the knee bent at right angles and then pass the pencil around the leg, as shown in Cut

Cut N 7.

Cut N 8.

N 5. If the amputation is below the knee, turn on the amputated side, resting the exterior surface of the stump and thigh on the paper, and mark around it, as shown in Cut N 6. Then, without changing the position of the body, flex the knee to about right angles, and mark around the thigh and stump, as illustrated in

Cut N 9.

Cut N 10.

Cut N 7. These diagrams will show the amputated leg in two positions, one with the stump fully extended, and the other flexed at right angles. If there is a limited motion in the knee joint, special care must be taken that the limits of extension and flexion

are shown in the diagrams. Then place the foot on the paper and draw a line around it, as shown in Cut N 8.

MEASUREMENTS.—After the diagrams come dimensions. Measuring should be done in the morning when the stump is not

Cut N 11.

Cut N 12.

swollen; a tape line should be used. Begin with measuring the distance from the crotch, or perineum, to the floor—the end of the tape line must be put close to the body between the legs and carried vertically down to the floor (see Cut N 9); in the same

Cut N 13.

Cut N 14.

way measure the distance from the crotch to the end of the stump (see Cuts N 10 and N 11). Measure from the end of the stump to the floor, as shown in Cut N 12 or Cut N 13.

While still standing take the circumferences of the sound thigh,

beginning close to the body, as shown in Cut N 14, repeat at points two inches apart, until the knee is reached, then take the circumference of the knee around the knee-cap, then the following

Cut N 15.

Cut N 16.

circumferences; the leg immediately below the knee-cap, the calf, smallest part of the ankle, just above the joint, the heel and instep, the instep, the foot at the base of the toes; then measure the length of the foot.

If the amputation is below the knee, take the circumference of the thigh close to the body (see Cut N 15) and repeat these cir-

Cut N 17.

Cut N 18.

Cut N 19.

Cut N 20.

cumferences at points two inches apart until the entire thigh is measured; then take the circumference of the knee around the knee-cap; then take the circumferences of the stump, beginning immediately below the knee-cap, and repeating at points two inches apart until the entire stump is measured. If the amputation is in or above the knee, take the circumference close to the

body and repeat at points two inches apart until the entire stump is measured.

After the circumferences have been taken, measure the distance

Cut N 21.

Cut N 22.

Cut N 23.

Cut N 24.

from the top of the knee of the sound leg to the floor when seated in a chair, with the leg bent at right angles (see Cut N 16).

Cut N 25.

Cut N 26.

Write all these lengths and circumferences on the diagrams in their respective places.

If correctly made, the diagrams of an amputation below the knee will resemble those figured in Cuts N 17 to N 20; for amputation in or above the knee they will resemble Cuts N 21 to N 24.

Other required measurements include the height of the person when standing erect on the sound leg. This can be taken by standing against a wall and the height marked by a book or carpenter's square (see Cut N 25); the distance from that point to the floor should then be carefully measured; then sit on the bare floor, with the back against the wall, and note the height from the top of the head to the floor, as shown in Cut N 26.

These heights are wanted to verify the length given of the leg. The height from the head to the floor when sitting subtracted from the height when standing is equal to the length of the leg.

INSTRUCTIONS WHEN BOTH LEGS ARE AMPUTATED

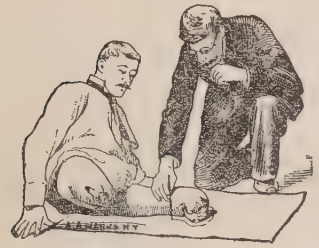
If both legs are amputated, either above or below the knees, or if one is amputated below and the other above, it is necessary to make diagrams of each stump and thigh, presenting both front and side views, with knee joint extended and flexed to as near right angles as possible. These can be taken by disrobing and

Cut N 27.

Cut N 28.

sitting on a piece of paper with the stumps extended and marking around them from body to the ends with a pencil held perpendicularly (see Cut N 27). Then turn to one side so that the exterior surface of the thigh and stump will rest on the paper; the stump extended, mark around the thigh and stump, then bend the knee to about right angles and mark around thigh and stump (see Cut N 28). A similar diagram must be made of the other thigh and stump (see Cut N 29). After these diagrams have been made, circumferences should be taken by passing a tape line around each thigh, close to the body, and repeating at points of about two inches apart until the thighs and stumps have been measured. Care should be given to take the measurements when the stumps are not swollen and to draw the tape line moderately tight, as shown in Cuts N 30 and N 31. Write all the measurements in plain figures in their respective places on the diagrams. Sit on

the floor, with back against the wall, and mark, by book or square, the distance from the top of the head to the floor, as illustrated in Cut N 32. Send this measurement, together with former height,



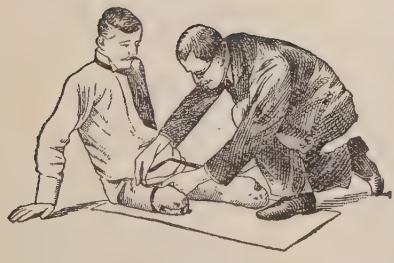
Cut N 29.

Cut N 30.

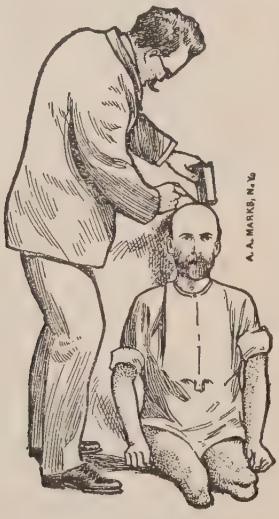
that is, the height before amputation. If the full former height is to be restored that fact should be noted.

Stumps that reach to the ankle joints or knee joints should be reproduced in plaster.

The following questions should be answered in every case: Name of patient? Post-office address? Occupation? Age?



Cut N 31.



Cut N 32.

Weight? Cause of amputation? When was the amputation performed? Which leg amputated? Has an artificial leg been worn? For how long? Name of the party ordering the leg? His address? Is the leg to be made and fitted from measurements in the absence of the patient?

If it is proposed to take weight on the end of the stump, that fact should be noted.

If the amputation is in the ankle joint or in the foot, the diagrams and measurements are the same as are required in amputations above the ankles.

Plaster Casts.—Plaster casts are only required of stumps that reach to the articulations (knee or ankle joints) or in the feet, and of deformed limbs, and of amputations that have resulted from deformities.

The method of making a plaster cast depends upon the condition of the stump. For tapering stumps, the following is the simplest: Remove the clothing, shave all hair from the stump or fasten it down with paste, or thick soap, as otherwise it will

Cut N 33.

Cut N 34.

cling to the plaster. Then take two quarts of thick, quick-drying plaster of Paris, such as used by dentists, put a quart of water in a bowl and sprinkle the dry plaster in it, mix thoroughly. It should be made about as stiff as "pancake dough;" then spread it over all sides of the stump to the thickness of at least half an inch. The stump must be held perfectly still until the plaster has become hard, which will be about ten minutes. Then draw it from the stump and the inside will be a counterpart of the stump.

If the stump is larger at the end than immediately above, as in the case of partial foot, ankle-joint, or knee-joint amputations, the plaster must be broken off in large pieces and put together after the stump is removed, or the string method can be used, as follows: A piece of strong, thin cord is passed loosely up each side of the limb (see Cut N 33), to which it is made to adhere

by thick plaster (see Cut N 34). Work quickly, using about four quarts of slacked plaster and cover the entire limb to a thickness of not less than half an inch. As the leg must be held vertically,

Cut N 35.

Cut N 36.

the plaster must be quite thick, otherwise it will flow down. Every part, the back, sides, front, and end, must be liberally covered. As soon as the plaster has become a little set, the string can be

Cut N 37.

Cut N 38.

pulled gently downward (see Cut N 35), cutting the mold into longitudinal parts. It must now be left alone, so as to thoroughly harden, which will take about ten minutes; the mold can then be

separated on the line cut by the string and the two parts removed (see Cut N 36). These parts can then be greased or oiled on the inside and put together and bound with a string; the inside can then be filled with thin plaster of Paris (see Cut N 37). When the mold is filled, it should be laid aside for several hours, when it will have become so hard that the shell will yield to slight pressure and break off, uncovering a facsimile of the stump.

Cut N 39.

Cut N 40.

The plaster bandage method is an excellent way of taking a cast of a flabby and tapering stump. A sheet of old muslin or cheesecloth is cut into strips about two inches wide and sewed into lengths of about twelve feet long. Three such strips are usually needed. Dry plaster should be spread on the strips which are then rolled up very tightly (see Cut N 38). No more plaster

Cut N 41.

should be put on than will fill the meshes. The stump should be prepared by removing the hair or fastening it down with paste or thick soap. The plaster bandage roll must be immersed in water and allowed to remain until the bubbles cease to come to the surface (see Cut N 39). It is then taken from the water and wrapped around the stump while being unrolled, beginning at the end of the stump and continuing to a little above the knee

(see Cut N 40), then work down and up again, covering the stump with three or more layers or until all the bandages have been used. Allow the bandage to remain on the stump until it becomes hard, when the stump can be withdrawn (see Cut N 41). The plaster bandage will form a mold of the stump, which can be sent to us as it is, or it can be greased and filled with slacked plaster, and a true cast made, as previously described.

Casts and molds should be sent packed in sawdust to prevent breakage. If shells are sent, they must be filled with sawdust, to prevent collapse in transit.

CHAPTER XVI

PRICES—ACCESSORIES—TERMS OF PAYMENT—GUARANTEE

Artificial Feet for Partial Feet Amputations, described on pages 27 to 36	Cut C 2	each	$ 30.00
	Cut C 5	"	50.00
	Cut C 18	"	60.00
	Cut C 25	"	60.00
	Cut C 27	"	60.00
	Cut C 28	"	100.00
Artificial Feet for Ankle-Joint Amputations, described on pages 37 to 44	Cut D 7	"	60.00
	Cut D 12	"	60.00
	Cut D 14	"	60.00
	Cut D 16	"	60.00
	Cut D 21	"	100.00
	Cut D 23	"	100 00
Artificial Legs for Below-Knee Amputations, described on pages 45 to 69	Cut E 2	"	100.00
	Cut E 7	"	100 00
	Cut E 17	"	100 00
	Cut E 28	"	65.00
	Cut E 40	"	100.00
	Cut E 44	"	100.00
	Cut E 46	"	100.00
	Cut E 50	"	100,00
	Cut E 51	"	100.00
Peg Legs for Below-Knee Amputations, described on pages 67 to 71	Cut E 54	"	15.00
	Cut E 55	"	30 00
	Cut E 56	"	75.00
Ferrules and Rubber Tips for Peg Legs, described on pages 71 and 72	Cut E 57	complete	2.00
	Cut E 58	each	1.25
	Cut E 59	"	.75
Suspenders, described on pages 71 and 72	Cut E 60	set	3.00
	Cut E 61	"	2.00
	Cut E 62	"	5.00
Straps attached to corsets Or, $0.75 for each strap, corsets to be furnished by wearer.	Cut E 63	"	1.50
Artificial Legs for Knee-Bearing Stumps, described on pages 73 to 77	Cut F 5	each	100.00
	Cut F 9	"	100.00
Peg Legs for Knee-Bearing Stumps, described on pages 77 and 78	Cut F 11	"	15.00
	Cut F 12	"	75.00
	Cut F 13	"	50.00
Artificial Legs for Disarticulated Knee Stumps, described on pages 79 to 83	Cut G 7	"	100.00
	Cut G 8	"	100.00
Artificial Legs for Thigh or Femoral Stumps, described on pages 84 to 93	Cut H 5	"	100.00
	Cut H 15	"	100.00
	Cut H 25	"	75.00

Peg Legs for Thigh Stumps	Cut H 26	each	$50.00
	Cut H 27	"	75.00
Suspenders, described on pages 94 to 97 .	Cut H 28	set	4.00
	Cut H 34	"	3.00
	Cut H 35	"	5.00
Straps attached to Vests	Cut H 36	"	3.00
Or, $0.75 for each strap, Vest to be furnished by wearer.			
	Cut H 37	"	6.00
Straps attached to Corsets	Cut H 38	"	3.00
Or, $0.75 for each strap, Corset to be furnished by wearer.			
Artificial Legs for Hip-Joint Amputations, described on pages 98 to 100 . . .	Cut I 5	each	100 00
	Cut I 7	"	150.00
Artificial Feet and Legs for Deformities, etc.,	Cut K 3	"	30.00
	Cut K 7	"	60.00
	Cut K 11	"	60.00
	Cut K 16	"	60.00
	Cut K 17	"	100.00
	Cut K 20	"	60.00
	Cut K 22	"	100.00
	Cut K 25	"	60.00
	Cut K 27	"	60.00
	Cut K 29	"	100.00
	Cut K 21	"	100.00
	Cut K 33	"	100.00
	Cut K 35	"	100.00
	Cut K 36	"	125 00
	Cut K 38	"	100.00
	Cut K 41	"	100.00
	Cut K 42	"	100.00
	Cut K 46	both	150 00
	Cut K 51	each	100.00
	Cut K 54	"	100.00
	Cut K 57	both	200.00
	Cut K 59	"	200.00
	Cut K 61	each	60 00
	Cut K 63	"	125.00
	Cut K 66	"	125.00
	Cut K 69	"	60.00
	Cut K 71	"	75.00
	Cut K 72	"	75.00

ACCESSORIES.—Needful supplies, as indicated below, are furnished without extra charge.

Artificial Foot for partial foot and ankle-joint amputation. A suitable sock for the stump, an extra lacing.

Artificial Leg for below-knee amputation. A suitable suspender, one long and one short stump sock, pocket oil can, screwdriver, and extra lacing.

Artificial Leg for all other amputations. A suitable suspender one sock for stump, lubricant for the knee-joint, screwdriver, extra spring, etc.

TERMS OF PAYMENT.—Payment is required in advance with every order. If preferred, one-half can be advanced and the balance paid on delivery. This is the plan on which payments are reasonably and properly required on all articles that are made to order.

GUARANTEES.—A guarantee for a period of five years covering material and construction is given with each leg.

CHAPTER XVII

HANDS AND ARMS, NATURAL COMPARED WITH ARTIFICIAL

History.—Artificial hand and arm construction has advanced with that of artificial legs. The modern arm is calculated for general purposes, the ancient had only one object in its design. M. Sergius (167 B. C.), referred to by Pliny, wore an artificial arm, with which he held his shield while in battle, and released Cremona from siege. The artificial arm made for a celebrated tenor of the sixteenth century was used successfully in his histrionic gesticulations; the arm of the celebrated Surgeon Pare, as well as the productions of Lorrain, Sebastian, Bailiff, Verduin, Serre, Wilson, and De Graef, and all the early makers, had but few functions to perform.

There is a strong inclination to the belief that artificial arm construction has retrograded, and that those of modern times are not as useful as those of the early masters. Visitors to European museums, where many of the archaic substitutes are exhibited, are impressed by the profuse and extravagant labels and catalogues, ascribing to the wearers miraculous deeds of valor, performed in battle.

We are in position to state that historic substitutes were useless beyond the specific purposes for which they were designed, and were greatly inferior to those of modern construction. The ancient arm weighed from twenty to thirty pounds, was made of steel, copper and leather, and could be worn only on a long and powerful stump. The modern arm weighs from one to two and a half pounds, is made of rubber, wood, rawhide, leather, and metal, and can be worn on short, enervated, and nervous stumps to advantage. They have a range of utility infinitely greater than those used by warriors centuries ago.

The need for artificial arms has never been as great as now. The incentive to invent and improve is always responsive to demand. Want begets supply, and competition is the stimulus that carries improvements close to the goal of perfection.

The Demand Greater.—The demand has increased in direct proportion to the utilization of machinery in the industries and to the expansion of methods for rapid transportation. As the mileage of railroads increases, the mutilation of the human body is more frequent. The electric trolley has maimed more than the horse-cars of a decade ago. The mowing machine and the reaper have cut off more limbs than the scythe or cradle, dynamite has mutilated the human body more than the black powder of

former days. These agencies, necessary for quick results, are dreadful implements of death and mutilation.

Simplicity.—In recent years the tendency of the arm manufacturer has been to simplify construction; the earlier devices were complicated, burdensome to carry, expensive to maintain, and unreliable. No one will now tolerate a clumsy, heavy, noisy, complicated, and unwieldly arm; neat adaptation to the stump, lightness and naturalness of appearance, durability and utility, are the only essentials that will satisfy.

What an Artificial Arm Must Do.—The artificial arm must conceal the loss, protect the stump, restore a natural appearance to the dismembered side, provide a medium that will force the stump into healthful activity, and, in the way of utility, it must assist the opposite hand, carry articles of moderate weight, and, if the stump is powerful, the hand must be capable of cutting food on the plate and carrying the morsels to the mouth. The modern arm is capable of all this, and still more. A pen can be placed between the finger and thumb, and, after a little practice, the wearer will learn to write quickly and legibly. Implements capable of specific functions can be held in the hand or in the socket. A ring will help the farmer in guiding the handles of his farming tools; it will assist the blacksmith in wielding the sledge. A pair of pincers is capable of holding the work of a jeweler, a claw hook, a clevis, a hand vise; in fact, a great variety of implements have their distinct uses. While these attachments are capable of a large range of adaptation, there is a limit beyond which art and science cannot go. These operations of the natural hand that depend on the brain for their functions cannot possibly be performed by mechanical devices.

The Natural Hand a Marvel.—The intelligence with which the natural arm is endowed is the result of the system by which mental force is carried from the brain to the distant fingers. The human hand and arm are marvels of mechanism, their combinations of motions are almost limitless, their functions vast, their capabilities beyond comprehension. The motion of the shoulder is circumrotary; those of the elbow, flexion and extension; those of the wrist, rotary, circumrotary, flexion, and extension, and the fingers are capable of a range of accommodation almost limitless. Every joint is connected by powerful sinews, tendons, muscles, nerves, and blood vessels, which perform their work in conveying the commands of the mind to the most distant parts, and in compelling an instantaneous obedience. The hand that is capable of placing the delicate works of a watch is capable of placing the stones of a cathedral. And yet the human arm is but a machine, useless by itself.

The Brain.—The brain is the vis-viva that renders it capable of its wonderful work. If the medium that conveys the wishes of the mind to the arm be destroyed, if the co-ordination be impaired, the natural arm ceases to be any more valuable than an artificial one of the crudest type.

An artificial arm, no matter how ingeniously it may be constructed, pales into insignificance when its functions are compared with those of the healthy arm nature has given us. Nevertheless, it is far more useful than the natural arm that has become palsied.

Self-Repairing.—The natural arm has other endowments, aside from its responsiveness to the will. The power of repairing itself is one of its mysterious attributes. The bearing surfaces of the bones would grind away, the tendons would stretch and become inert if this process were not in constant operation. If a muscle becomes lacerated, or a tendon detached, or a bone broken, the work of reparation soon restores the injured part to its normal relations. Every drop of blood that flows through the arteries carries new material to replace the waste, and every drop of blood that flows through the veins carries away the particles that have become diseased and detached. In old age, when the human repair shop becomes disorganized, the entire physical mechanism breaks down, and the end soon follows.

Sense of Touch.—Another great and important endowment of the natural hand is the sense of touch. This sense is susceptible of cultivation. The contact of the fingers will convey the information that the substance is soft or hard, liquid or solid, dry or wet. The blind man is capable of reading by the tips of his fingers. When we place our hands in our pockets, we know by this sense whether we take hold of a key or a jackknife, a handkerchief or a lead pencil. The moment we touch the object we know what motions the fingers are to make and the strength required to put that object within our grasp.

An artificial hand is absolutely devoid of sensation. When we call to mind the fact that an artificial arm, made with joints, springs, and cords cannot be endowed with mental sympathy or with the power of repairing itself, or with the sensation of touch, we must become reconciled to the fact that it is necessarily of limited capacity.

Stories Misleading.—We are frequently amused by reading newspaper articles on artificial arms, made by forgotten mechanics, "that are fully as good as natural arms." We frequently have to listen to the narration of some magical performances of men who wear artificial arms. We recall an article that appeared in a Canadian newspaper, of a woman who had a pair of arms adjusted to her person, supplementary to her natural ones. She became so dexterous in manipulating them that when in a public conveyance she would hold a book in her artificial hands, and, while apparently reading, would, with her natural hands, pick the pockets of those who sat next to her.

We have also read the story of a politician who lost his arm in the Civil War, and who had an ingenious artificial one applied that enabled him to shuffle a deck of cards, pick up a glass of beer and carry it in his mouth; and, on one occasion, when in a barroom brawl, he liberated a spring, and the arm immediately began

its pugilistic movements, with more vigor and more deadly results than possible for the natural arm. Quite recently a New York paper gave a page to the description of an artificial arm, made by a German prothesist, that incases the undeveloped arm of the Emperor of Germany; the description of the arm and the functions it was capable of performing were extremely absurd and amusing to those acquainted with prothesis, but to laymen unacquainted with the subject, there was a strain of plausibility that must have made some persons believe that at last a mechanic is on the earth who is as skillful as Divinity Himself.

CHAPTER XVIII

IS IT PROFITABLE TO BUY AN ARTIFICIAL ARM?

If I procure an artificial arm, will I make any practical use of it? If I do not, can it in any way contribute to my physical or mental comfort? Is the risk worth taking?

These are the questions that have to be answered. They weigh heavily upon the minds of those who find it necessary to exercise economy in their purchases.

Whether male or female, rich or poor, the feasibility of substituting a member that has been lost must be thoughtfully considered.

Let us first take up the question of ornamentation.

ORNAMENTATION.—That a person will make a better appearance with an artificial arm properly dressed than with an empty sleeve,

is obvious. To conceal any physical defect is a natural aim. There is nothing so distressing, especially to a sensitive person, as the exhibition of any imperfection in his anatomy.

The glass eye is worn for no other purpose than ornament. It fills a sightless socket and conveys the impression that the natural eye is there; it does not restore vision nor fulfill the optical functions, yet thousands of them are worn with a feeling that they are indispensable. They certainly look well, and are to be preferred to the cloth patch frequently seen. The man with a hunched back pays his tailor very dearly for the skillful adjustment of pads in his coat, so as to minimize the visibility of his deformity.

Any deficiency of the body that becomes conspicuous will attract attention and invite comment and sympathy. No person who maintains his self-respect, no matter what his disability may be, cares to be constantly reminded of it, and the commiseration of others, above all things, is the most abhorrent. To be frequently asked: "How did it happen?" "Did you lose your arm in the war?" "Were you in a railroad collision?" or to have such utterances as: "Poor, unfortunate man!" "How he must have

suffered!" "What a terrible loss!" whispered within your hearing, may, for a while, be accepted in good part, but their repetition soon becomes annoying and odious.

An artificial arm will conceal the loss, restore a natural appearance to the person, avoid observation and comment, and after it has been worn a short time will become companionable and necessary to the wearer's mental comfort.

The Russian prince, Galitzin, obtained an artificial arm of us to cover a deformed and undeveloped member, the conspicuousness of which had given him much solicitude. He was elated over the results and pronounced the purchase a most satisfactory one, fully paying him for his long journey from Moscow to New York.

Miss Julia Shay Lindsay, of Polk County, Minn., struggled with this subject for some time, and finally ordered an artificial

hand. The results that followed are clearly set forth in a letter recently addressed to us: "It is over five months since I received the artificial hand which my doctor ordered for me. I am very much pleased with it. No one can tell the artificial hand from the natural one. In this, it is a source of great comfort."

A. T. Basden, of Hamilton, Bermuda, who had both of his arms amputated between the elbows and wrists, wrote recently, as follows: "The artificial arms you sent me fit acceptably. They meet with my expectations. I find them helpful and especially valuable, as they hide my misfortune. Prior to the application of the arms, I suffered considerably with my stumps, but since wearing them the pain has entirely ceased."

Hygiene.—This part of the subject, considering the importance it bears to the general health and welfare of the individual, has not been sufficiently emphasized. With much pleasure we quote

from Dr. Schenck, of Cincinnati, Ohio: "Pain is the cry of a hungry nerve for food.

"When a part of the body becomes inactive, as is the case with the stump of an amputated arm, the inability to receive the necessary activity on account of the abbreviation of its length, permits the stump and muscles to fall into a quiescent condition; in consequence there occurs a stagnation in the venous system, which depends entirely upon muscular activity for the return of the venous blood to the lungs for aëration, from whence it is again pumped by the heart to the different parts of the body, in order to carry nourishment and oxygen to the tissues so that the normal metabolism can occur, and thus produce the physiological tone required for a healthy individual.

"As such, an abbreviated member, unassisted, cannot contribute the necessary energy for its welfare; because of the above-explained pathological condition, it must suffer and lose its normal tone and indirectly, as in diseased organs of the body, affect the general economy in a more or less degree, depending upon the temperament of the individual.

"So that, from the hygienic view, an artificial arm will cause the defective part to functionate, causing activity of the remaining muscles, and thus stimulate its circulation, giving to the part the required nourishment and preventing the accumulation of effete material and dismissing a conspicuous deformity, which, no matter how indifferent the unfortunate assumes to be, has some influence upon his nervous system, all of which, being improved, is conducive to promote a healthy tone to the whole body."

It is not an infrequent occurrence for a person to complain of peculiar, dull aches, or nerve twitchings, or sharp, stinging darts of pain in his stump. Investigation will disclose the fact that these are nervous disturbances, due to muscular inactivity, and, as soon as stumps are forced to do something, the distress will almost invariably disappear.

Dr. Cook, United States Examining Surgeon, puts this phase of the subject in an interesting and unique light:

"When a limb has been amputated, the stump, or remaining portion, takes on queer antics and assumes conditions that are in accordance with well-known physiological and psychological laws.

"For instance, it is no uncommon occurrence for a man who has lost a part of his leg by amputation to have a severe pain in the heel, foot, or toe of the lost member, or for those who have lost parts of their arms to have excruciating pains in the wrists, hands, or fingers of the amputated parts. To those unaccustomed to these nerve complications this may appear absurd, but they are facts well known to neurologists.

"It would seem that the stump, or part remaining after amputation, either resented the indignity that it had been subjected to, or else made its sorrow for its loss manifested by these means.

"The man who allows an amputated arm to hang indolently by his side makes a mistake. The muscles above the stump shrink and waste away for a lack of nourishment, and the nerves become irritable and neuralgic. An undisputed physiological law is that 'action increases strength,' and the reverse is just as true, that inaction produces weakness.

"Place an artificial arm on the idle stump and it at once begins to get a better circulation of the blood, the muscles begin to develop, and the nerves have something to think about besides their terminals."

Dr. L. G. Armstrong, of Boscobel, Wis., in emphasizing the importance to persons who have had legs or arms amputated, to procure artificial ones, presents in a forcible way the penalty that must be paid if a stump is permitted to become indolent:

"Artificial limbs have added much to afflicted humanity in the way of happiness and comfort.

"Physiology teaches plainly that the want of use of any part begets weakness. Atrophy of the muscles is sure to follow, which is the legitimate consequence of the neglect. To prevent this, begin using the stump as soon as it is thoroughly healed, when the adhesions are perfect, save atrophy, and put the muscles to their new use. Neuralgia of the stump is always sure to follow, or it may even antedate the withering away of the muscles for the want of proper use. Get a well-made, perfectly fitting limb, and you have at once removed the cause of nervous disturbances and the mental shock. You have added much to the person's ability to earn a livelihood. My experience is that artificial limbs are soon accepted, and soon used to advantage, and so much so that money would not induce the wearers to do without them. My advice is to get an artificial limb at the first practical moment, after the stump is perfectly healed."

Dr. T. P. Smith, of Tacoma, Wash., says: "During the last fourteen years you have fitted a great number of my patients with artificial limbs, and they have all given entire satisfaction. The proposition that a limb, whether a stump or whole, needs and is benefited by motion, is so self-evident as not to call for discussion; a stump becomes useless without it.

"I am in the habit of using motion in all cases of fracture, as well as in all cases of amputation, to prevent atrophy of the muscles, and stiffening of the joints, and as soon as a stump, after amputation, is healed, I insist on applying an artificial limb. Until the limb comes, I insist on the patient doing the best he can toward exercising and using his stump. After the limb is adjusted he will naturally use it, and that will prevent the stump from becoming flabby and fat.

"In conclusion, I will say that I know of no way to retain the use of a leg or arm, except it be early fitted with an artificial limb, and the sooner it is done the better. In spite of bandaging, and such motion and exercise as patients can give their stumps, they become large and flabby."

Dr. Geo. E. Powell, La Crosse, Wis., writes: "We have had your artificial limbs for twenty years and consider them the best made. We have never applied one that did not give satisfaction. Many arm stumps that were soft and doughy to the feel, became strikingly firm and vigorous with the use of artificial arms."

Dr. Chas. F. Noe, of Amana, Ia., states: "I wish to say that in my experience a well-fitting artificial arm exercises a beneficial influence on the stump, due to the stimulus given to circulation and nutrition, and thus preventing stagnation from disuse."

Dr. J. H. Sieling, of York, Pa., says: "The arm that you sent me recently has done more work than my fondest hopes expected; it has not only had a helping influence on my patient's stump, but adds greatly to his appearance. He is able to execute some very helpful acts with the elegant equipment; he eats, by its help, very artistically indeed. I am only too glad to add a word of commendation whenever opportunity offers."

Carl M. Person, of Webster County, Neb., states: "I will write to you and let you know that my arm is all right. I have worn it every day since I got it, and have never been chafed or experienced any inconvenience. The arm is useful as well as ornamental. I find that the exercise my stump receives from it prevents those dull pains that I suffered from for so long a time, and I value it for this reason far more than the money it cost."

William F. Starner, of Carroll County, Md., writes: "I have been wearing one of your artificial arms for about three years, and am well pleased with it. I can do most any kind of work. The arm exercises my stump, and keeps it in a more pleasant condition."

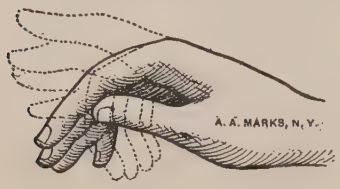
The utility to be derived from an artificial arm depends very largely upon the length of the stump, the strength of the muscles, and the aptitude of the wearer. The stump must be long in order to provide a lever with which to control the hand and forearm in lifting such articles as may be placed in the hand. Although the artificial arm is very light, the power to elevate it must come from the muscles in the arm and shoulder, and when the stump is very short, and the muscles weak, the utility of an artificial arm is lessened. But, notwithstanding these conditions, the artificial arm should be worn on the shortest of stumps. There are persons who have more aptitude than others, and perform feats under adverse conditions that are marvelous; some with short stumps do more than others with long ones. It is safe to say, however, that any person, no matter how short a stump he may have, may, with patience and application, learn to operate an artificial arm, and derive a reasonable compensation from it. Ambition, application, and thoughtful effort will overcome many difficulties. If one person can learn to write quickly and legibly with an artificial hand, why should not another? If one person can handle a farming implement, such as a hoe, rake, ax, or wheelbarrow, or a carpenter can drive his plane, hold a nail or carry tools, there is no reason why others should fail.

CHAPTER XIX

WOODEN HANDS. RUBBER HANDS

Old Methods.—During the first decade of our prothetical career (from 1853 to 1863), we manufactured mechanical hands, they were carved from wood with fingers jointed at the knuckles, controlled by straps operated by the shoulder. By a forward motion of the opposite arm, the strap would apply a pulling force to the artificial hand and force it to open. By relaxing, the strain on the strap would be released and the hand would close. It would seem as though a hand of this character would be useful and valuable, but when the invariableness of the spring tension, the oppressive harness to be worn, and the exertion required to operate the straps were considered, it was doubtful that the results obtained justified the means employed.

New Methods.—In 1863 our attention was attracted to the utilization of rubber, the resilient nature of which appealed to us as being better adapted to the purposes of an artificial hand than harsh, unyielding wood or metal. The rubber hand was thereupon invented. It was cast in a mold made from the model of a natural hand, and it was attached to the end of the artificial forearm by means of a spindle. The fingers were flexible and would yield under pressure, having sufficient elasticity and adhesion to hold light articles. It presented a natural appearance and was pleasant to the touch. It was far more durable than the wooden hand. It might fall or strike a hard object and would not break. It could be slipped from the socket and a hook, knife, fork, brush, ring or other implement put in its place. For a number of years this hand found many purchasers, and was



Cut O 1.

Cut O 2.

greatly admired. Improvements were suggested from time to time.

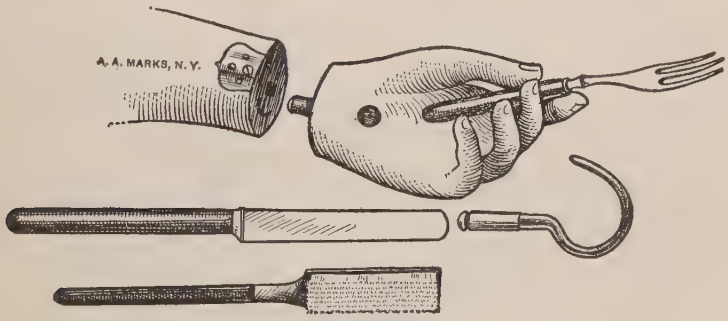
Ductile Fingers.—A fortunate thought was that of changing the fingers from flexibility to ductility. Flexible fingers would move under pressure, but as soon as that pressure was released

they would return to the positions in which they were cast. The ductile fingers admit of change of position. The wearer can, by the opposite hand, or by pressing the fingers against some resistant object, change their positions from full extension to clinched. The hand with fingers partly closed is sufficiently firm to carry a valise or package. Cut O 1 represents the rubber hand partly closed. The dotted lines indicate the positions of extension and flexion in which the fingers can be bent.

Palm Locks.—A lock embedded in the palm, shown in Cut O 2, receives and holds implements with firmness. A hand brush, a knife and fork (as shown in Cut O 3) can be thus placed and have the appearance of being grasped by the fingers. When it is required to carry articles of considerable weight for a great length of time a steel hook is slipped in the palm socket, and, concealed by the hand, it is held with sufficient strength to carry an article of one hundred pounds in weight. A knife or fork can be put in the same socket; the latter will hold a piece of meat while it is being cut with the opposite hand, and will convey food to the mouth. A brush placed in the palm lock can be used in washing the opposite hand. When it is desired to remove an implement a little pressure is applied to the button and the implement is released, and can easily be taken from the socket.

Wrist Connections.—Rubber hands are attached to forearms by various methods.

Cut O 3 represents the spindle method. A steel spindle is attached to the base of the hand, and made to fit a locking plate secured to the base of the forearm socket. The hand when so placed will rotate at the wrist if the wearer wishes. When it is



Cut O 3.

desired to remove the hand a little pressure applied to a button will release the hold, it can then be taken from its place. When it is desired to prevent the hand from rotating a set screw is turned inwardly, and the hand is clamped firmly in one position. A variety of implements are illustrated in the cuts O 4 to O 7, each can be placed in the forearm substituting the hand.

Clamps.—Cut O 8 represents a new device for a wrist-joint connection, it is intended for a person who works at the bench. The

end of the forearm is made of aluminum, and provided with a sliding jaw operating as a vise. A cold chisel can be held firmly at any convenient angle, shown in Cut O 9; a saw-file can be used to advantage, as shown in Cut O 10. A jeweler's hammer, or in fact any implement with a handle not greater than ⅝ of an inch in diameter can thus be held in a thoroughly practical way.

Flexion.—The mortise and tenon wrist connection is preferable

Cut O 4.

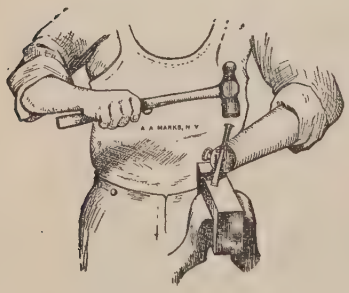
Cut O 5.

Cut O 6.

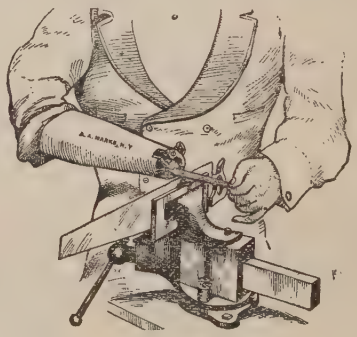
Cut O 7.

Cut O 8.

to any wrist mechanism that admits of flexion and extension. Cut O 11 represents this method. The mechanism consists of a series of interlaying strips, held together by a bolt, which forms the axis of motion. Rotation of the arm is obtained, when de-



Cut O 9.



Cut O 10.

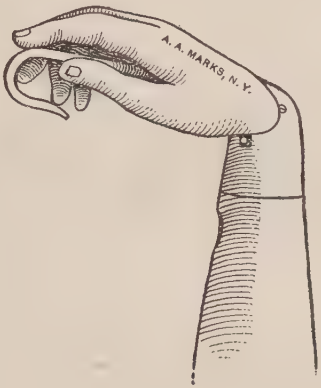
sired, by means of a bolt connection introduced immediately above the wrist joint.

Cut O 12 represents the mortise and tenon connection, the hand flexed holding hook. Cut O 13 shows the hand extended, with fork held by the palm lock, the knife and other implements are held in the same way.

For laborers who wish to obtain the greatest variety of prac-

tical uses from artificial arms, the spindle connection at the wrist (Cut O 3) is preferable. This device admits of greater strength and enables the wearer to press the artificial hand against any object desired to be held in place. The mortise and tenon wrist

Cut O 11.



Cut O 12.

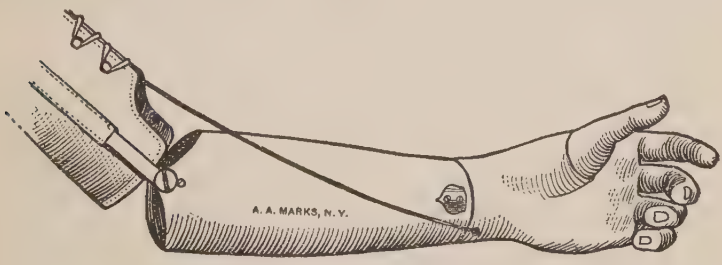
Cut O 13.

connection, illustrated in Cut O 11, is chosen by persons seeking ornament more than utility.

When lightness is a paramount consideration it is advisable to have the hand permanently attached at the wrist.

This method obviates any metal connection, and thereby lessens the weight.

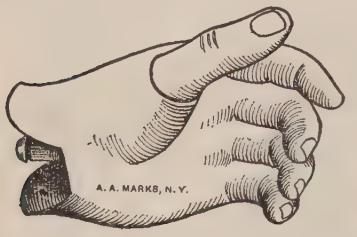
Spring Thumb.—We have a mechanical device by which the thumb can be made to move at its base, away from or toward the fingers. Cuts O 14 and O 15 represent the hand with the thumb ab-



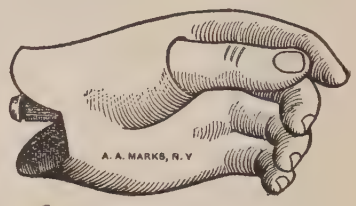
Cut O 14.

ducted; this is effected by tension applied to a cord passing from the under side of the base of the hand upwardly to the elbow. Cut O 16 represents the hand with thumb pressed against the finger. As soon as the tension of the abductor cord is released, the thumb will be forced by a strong spring to press against the index and middle fingers. When the abductor cord is connected with the

artificial arm above the elbow, the thumb will press against the forefinger when the elbow is flexed, and will draw away from it when the elbow is extended, as shown in Cut O 16. The abductor cord may be carried up the arm, over the back, around the opposite shoulder, by which it will be controlled. When thus



Cut O 15.



Cut O 16.

connected it is independent of elbow motion and is operated by a movement of the shoulder or contraction of the chest.

As considerable mechanism is required in the spring thumb, the construction is more or less complicated, and we do not advise its selection except in special cases. In double amputations, when all dependence must be placed upon artificial means, spring thumbs are advantageous; but in single amputations they prove to be quite useless; the remaining natural hand becomes so adept that it performs about all the work that prior to the amputation was performed by both hands.

Gloves Always to Be Worn.—Artificial hands and parts of hands must be gloved at all times. This is necessary in order to conceal the fact that they are not real. Artificial hands, whether made of wood, rubber, or other material, may be modeled to the shape of nature, and have all the graceful lines, creases, and folds that are found in the natural hand..

They may be painted and tinted with artistic nicety, yet it is not possible to impart to them the characteristics which distinguish nature from art. The natural hand has a different tint in the forenoon than it has in the afternoon; when the fingers are extended there are more creases in the skin than when they are flexed; when the hand is at labor it is broader and the muscles and blood vessels show with more prominence than when at repose. An artificial hand, no matter of what material it may be constructed, cannot possess this metamorphic power. It, therefore, must be concealed by a glove, otherwise it will be conspicuous.

Choice of Material for Sockets.—Sockets for artificial arms may be made of wood, leather, or aluminum, to suit the wishes of the purchaser. Makers of experience are united on this point, and advocate the use of tough, light wood. Wood is capable of being worked into convenient shapes, which it will retain indefinitely. It is lighter than any other material that can be used,

and when strengthened with rawhide is sufficiently strong for most purposes. It is also a non-conductor of heat, and when varnished does not absorb perspiration. The objection to leather is its flexibleness. While this may appear to be desirable, it is actually the cause of trouble. A socket that is flexible cannot be comfortable to wear, as it does not place the pressure at points of toleration; instead, it distributes it uniformly over the entire surface, causing pressure to come as much on sensitive parts as elsewhere. Leather absorbs perspiration, becomes foul and offensive, and unless extraordinary methods are used to keep it clean it will become hard and dead, it will crack and fall to pieces.

Leather sockets are sometimes unavoidable; they will be spoken of in due course.

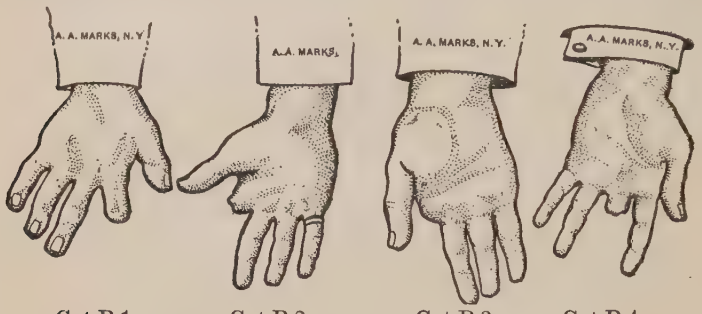
Metal sockets are objectionable on account of their weight, liability to corrode from perspiration, and their disposition to hold heat. When arms are to be made for persons who work in water, such as dyers, laundrymen, fishermen, oystermen, etc., it will be necessary to use metal, such as aluminum, which receives no injury from exposure to moisture free from salt.

A rubber hand permanently attached to an aluminum socket will provide a useful, resistant, and durable arm, and when frequently cleaned and coated on the inside with sweat-proof enamel or paint, will last a great many years.

CHAPTER XX

PARTIAL HAND AMPUTATIONS

The loss of a finger may be lamentable, but it cannot be considered a serious impairment. The remaining fingers as a rule are competent to perform all the labors that are usually demanded of the complete hand. Yet there are times when the substitution



Cut P 1. Cut P 2. Cut P 3. Cut P 4.

of a lost finger is essential, either for cosmetic effect or to equip the hand for some special purpose; for example, playing the piano, or other musical instrument.

The Loss of One Finger.—Cuts P 1 to P 6 represent hands from which one finger has been removed. An artificial finger

Cut P 5. Cut P 6. Cut P 7. Cut P 8.

similar in appearance to that illustrated in Cut P 9 meets the needs of each case. The loss of the thumb, far more than of a finger, impairs the usefulness of the hand. It is, therefore, more important to substitute that loss. Cuts P 7 and P 8 represent

hands from which the thumb has been removed. An artificial thumb similar to that shown in Cut P 10 is suitable for such cases.

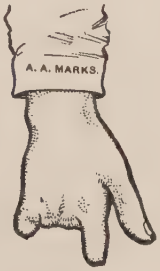
MATERIALS.—Artificial fingers and thumbs are made of rubber,

Cut P 9.

Cut P 10.

aluminum, or silver. Rubber is preferable, if flexibility is desired; aluminum is better, if lightness is the most important feature;

Cut P 11.



Cut P 12.

Cut P 13.

Cut P 14.

silver has the greatest durability. The price is the same for each. When ordering send a plaster cast of both the mutilated and op-

Cut P 15.

Cut P 16.

Cut P 17.

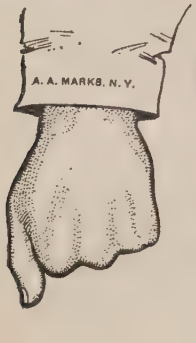
Cut P 18.

posite hand, one is required for fitting, and the other as a guide in shaping the outside to correspond with its mate on the opposite hand. If the stump, either finger or thumb, is very short, it will be necessary to hold the substitute in place by straps passing around

the base of the hand, or by a glove. If the stump is long, the substitute will remain in place without additional support.

It is important that the artificial part should be covered at all times by a glove, as it is not possible to give it the characteristics of nature closely enough to defy detection.

The Loss of Two or More Fingers.—Cuts P 11 to P 22 represent hands from which two or more fingers have been removed.



Cut P 19.

Cut P 20.

Cut P 21.

Cut P 22.

An artificial part for any of these cases consists of rubber fingers attached to a socket that incases the remaining part of the natural hand. This is essential in order to hold the fingers together and provide means for securing them to the stump.

Cut P 23 represents an artificial hand devised to supply the amputation of index and small fingers. Cut P 24 represents

Cut P 23.

Cut P 24.

Cut P 25.

Cut P 26.

an artificial hand suitable for use when the index, middle, and small fingers are amputated. Cut P 25 shows an artificial part to substitute the loss of middle and ring fingers. Cut P 26 represents an artificial hand, suitable for a palm amputation, in which the natural thumb remains. The fingers in all the above hands are made ductile, rigid, or flexible, according to the choice of the wearer. For those who do little work and wish to combine ornament with utility, the ductile

fingers should be chosen. For a laboring person, who wishes to lift heavy weights and do hard work, the rigid fingers are better. And for those who wear artificial fingers and parts of hands for ornamental purposes only, the flexible fingers give the greatest satisfaction.

Individual Fingers.—Where the amputation of one or more fingers has been made at the first or second joint, it will not be

Cut P 27.

Cut P 28.

Cut P 29.

Cut P 30.

necessary to have the artificial fingers connected at their base; separate fingers, as represented in Cut P 9, can be used.

Amputations that have been made in the palms of hands are capable of prothetic treatment, giving natural appearances to the mutilated members as closely as conditions will admit. If the remaining part of the hand provides a stump that will control the artificial part, a considerable amount of utility can be looked

Cut P 31.

Cut P 32.

Cut P 33.

Cut P 34.

for; but if the stump is of such a character as to offer little or no leverage by which the artificial parts can be controlled, scarcely anything beyond ornament can be assured.

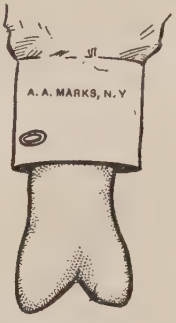
Construction.—The hand below the fingers is made of rubber, combined with canvas and leather, providing a socket for the remaining part of the amputated member; this is laced on line with the palm. If the remaining thumb is greatly abducted, as shown in Cuts P 19 and P 20, caused by the weakening of the flexor muscles, it will be difficult to apply an artificial part that

will possess more than an approximate approach to nature in appearance. It will, nevertheless, materially improve the hand and add to its utility.

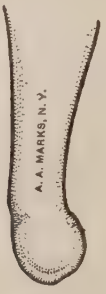
When amputations remove the thumb, as well as the fingers, as shown in Cuts P 27 to P 37, the artificial hand required will resemble that shown in Cut P 38. This hand is similar in construction to that previously described.

It must be noted that on account of the stump occupying the

Cut P 35.



Cut P 36.



Cut P 37.

Cut P 38.

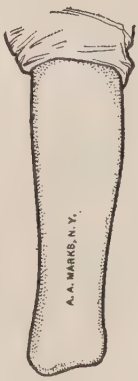
interior of the artificial palm, there can be no mechanism in the hand. When it is desired to have an appliance connected with the artificial part that will hold implements of utility, rings passing over the fingers, or plates riveted to the palms, must be used. These are only furnished when they are especially requested at the time the order is placed.

CHAPTER XXI

WRIST-JOINT AMPUTATIONS

When a hand is amputated at the wrist articulation, the ulnar

Cut Q 1.



Cut Q 2.

Cut Q 3.

and radial (or styloid) processes are sometimes trimmed off, and

Cut Q 4.

Cut Q 5.

Cut Q 6.

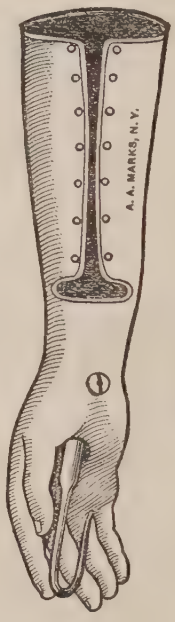
Cut Q 7.

sometimes left as they are, as these prominences form means by which the artificial part can be held firmly to the stump.

Flat Ends.—Cuts Q 1 to Q 7 represent amputations in the wrist, in which the styloid prominences of the ulna and radius

Cut Q 8.

Cut Q 9.

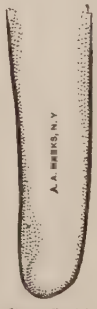


Cut Q 10.

Cut Q 11.

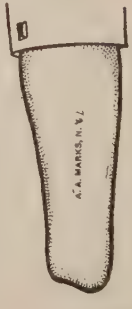
are present. These stumps require artificial arms constructed on the plan shown in Cut Q 8. The hand is of rubber, with ductile fingers, a locking arrangement is imbedded in the palm, as

Cut Q 12.



Cut Q 13.

Cut Q 14.

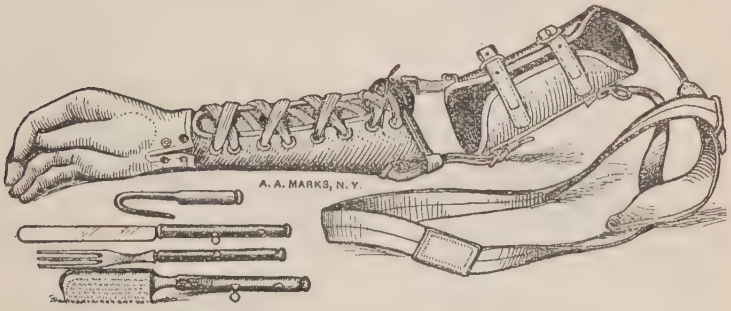


Cut Q 15.

described. The hand is permanently secured to a leather socket, which is formed on a cast of the stump. The arm thus constructed is then placed on the stump and laced down the frontal line. Implements for the table, working, and for washing, etc.,

can be placed in the palm, where they will be held firmly. Cuts Q 9, Q 10, and Q 11 show the various implements in place.

Tapering Ends.—When the styloid prominences have been removed and the stump becomes a tapering one, as shown in Cuts Q 12 to Q 15, an artificial arm constructed on the plan of that



Cut Q 16.

represented in Cut Q 16 must be used. This arm is practically the same as that shown in Cut Q 8, with the exception that it is supplied with attachments that go above the elbow and connect with suspenders resting on the shoulders and passing around the body. These are essential to keep the arm from slipping off the tapering stump. Useful implements can be held in the hand, as shown in Cuts Q 9, Q 10, Q 11.

CHAPTER XXII

FOREARM AMPUTATIONS

When an amputation has been performed at any point between the elbow and wrist, the stump that remains is called a forearm, or radial stump. Cuts R 1 to R 6 represent forearm stumps of a variety of lengths and conditions. The most suitable artificial arm for an amputation of any of the above is illustrated in Cut R 7. The socket is of wood, leather, or metal, as may be selected, shaped interiorly to receive the stump in the most accommodating

Cut R 1.

Cut R 2.

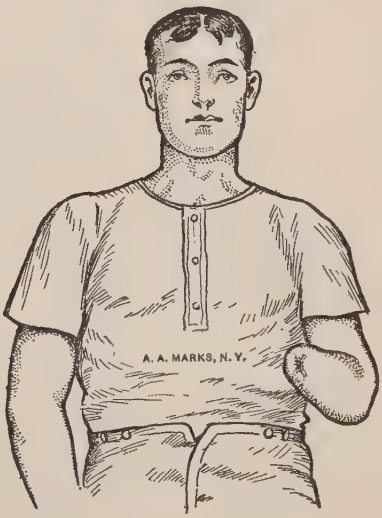
way. The outside is given the contours of the natural arm as closely as conditions will admit, it is then covered with rawhide and enameled a natural tint.

Leather Elbow Joints.—The arm being intended for a long radial stump, the connection with the upper arm piece (incasing the muscle part) is of flexible leather, so as to permit a great range of motion; being adjustable, it can be tightened or loosened, as required; it is absolutely noiseless and very strong; being flexible, it admits of rotation of the forearm. The hand is of

Cut R 3.

Cut R 4.

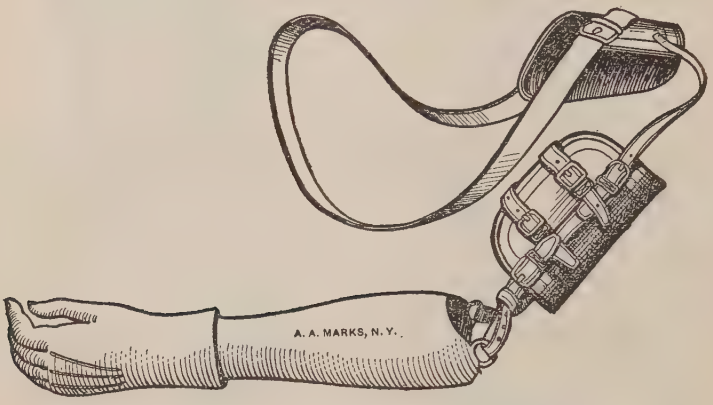
Cut R 5.



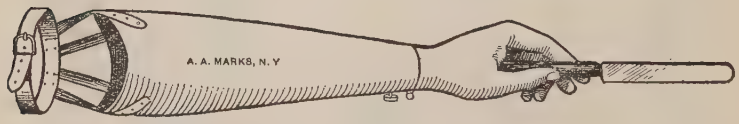
Cut R 6.

rubber, with ductile fingers, as heretofore described. The connection at the wrist is by the spindle or the mortise and tenon method, or the hand can be permanently attached.

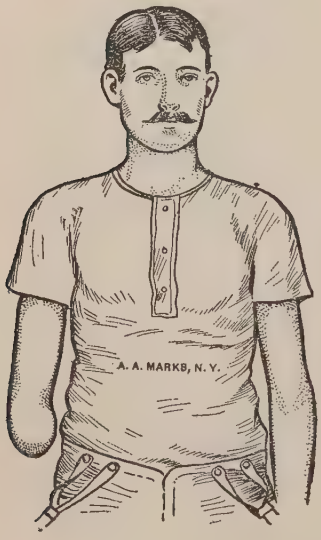
The part incasing the arm above the elbow is made of leather, with suitable straps for regulating pressure. Shoulder straps and



Cut R 7.



Cut R 8.



Cut R 9.

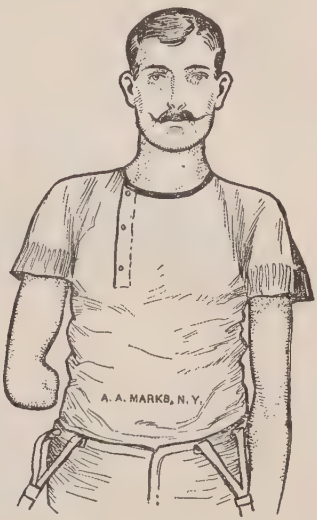
Cut R 10.

suspenders are attached to the upper part of this section.

Arms of this construction are thoroughly available for stumps below the elbow five or more inches in length.

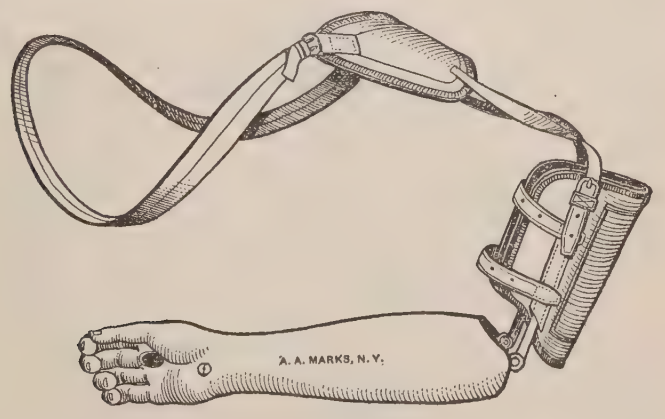
It is sometimes desirable in long radial stumps to secure the arms by a narrow strap above the elbow instead of by the long

Cut R 11.



Cut R 12.

leather muscle part. Cut R 8 represents an arm of this character. This method of attachment is adequate when the artificial arm is



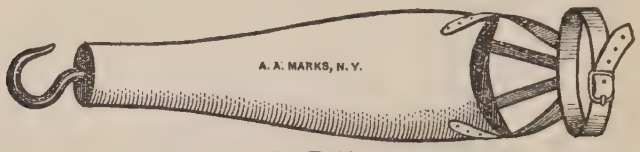
Cut R 13.

not used for carrying heavy articles or in performing laborious work.

Steel Elbow Joints.—Radial stumps that are shorter than five inches, as shown in Cuts R 9 to R 12, require a firmer method of securing the stump socket to the upper-arm part than the leather

joint above described. Cut R 13 represents an artificial arm constructed practically the same as R 7, differing in the elbow joint. Steel hinge joints are used instead of leather. While there is less freedom in the elbow movement, the steel joints place the arm under firmer control of the stump.

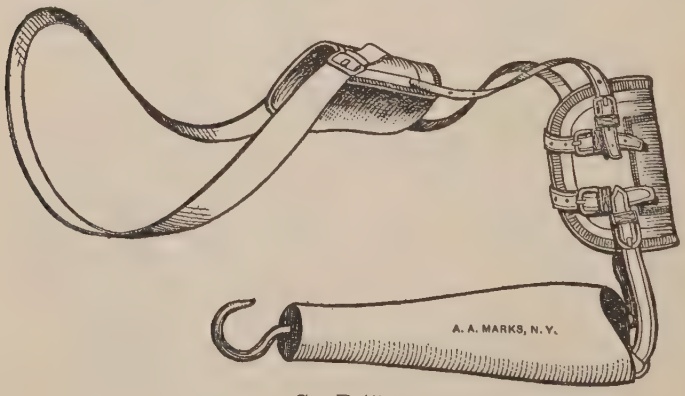
Short Stumps.—This arm is, as a rule, made with hand permanently attached, in order to minimize weight. When an amputation below the elbow leaves a stump so short that when flexed the



Cut R 14.

projection beyond the line of the upper arm is insufficient to control the movements of the elbow, it must be treated the same as an amputation in the elbow joint, as described in the following chapter.

Arms without Hands.—Peg arms for radial stumps are of several kinds, made of wood, leather, or aluminum; they are practically artificial arms without hands. Cut R 14 represents a peg arm without long muscle part or suspenders. Cut R 15 shows a peg arm with long muscle part and suspenders; both the

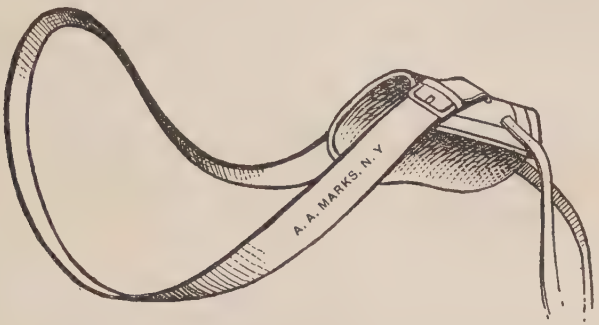


Cut R 15.

above peg arms are constructed in the same manner as those heretofore described, the absence of the hand is the only difference. Farming, shop, and other implements can be devised for specific purposes and held in the ends of the forearms.

Suspenders.—Cut R 16 represents a suspender suitable for an arm for a radial amputation. Suspenders must be renewed occasionally, according to the demands that are made upon them by

the wearer. If the arm is used by a laboring person and he perspires very freely, a new suspender will be required more frequently than if less destructive conditions prevail. The suspender can be procured independent of other parts. It consists of a



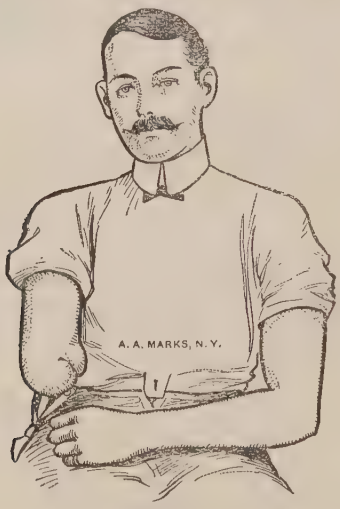
Cut R 16.

plate of leather shaped to rest on top of the shoulder and fit close to the neck. A webbing strap passes around the body under the opposite arm and buckles to the suspender in front.

CHAPTER XXIII

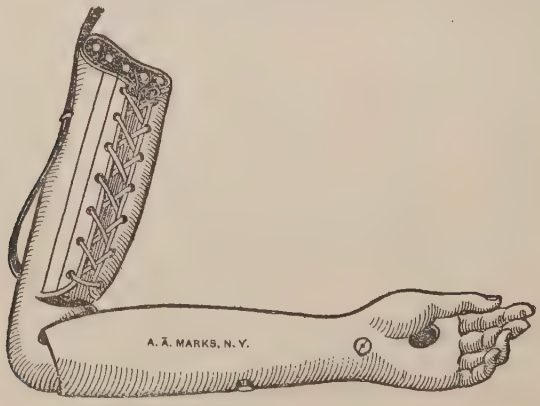
ELBOW-JOINT AMPUTATIONS

Amputations in or immediately below the elbow joints, leaving



Cut S 1.

stumps so short they cannot be availed of in controlling the arti-



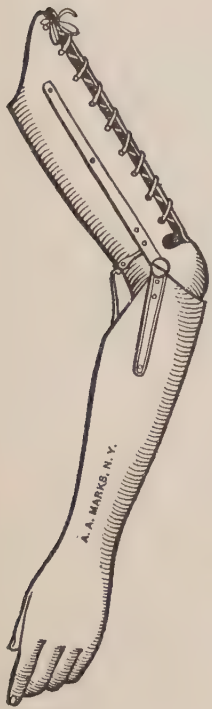
Cut S 2.

ficial elbow joint, require artificial arms of special construction.

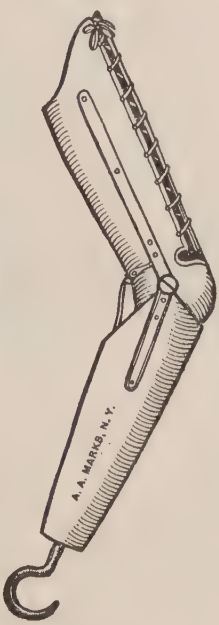
The presence of the condyles, or bony prominences, affords an opportunity for fitting that will secure firmness without employing shoulder straps, or, if not dispensing with them entirely, simplifying them very materially.

Short Radial Stumps.—Cut S 1 represents an amputation a little below the elbow joint, but very close to it, leaving a stump so short that it cannot be utilized. A suitable arm is illustrated in Cuts S 2 and S 3. This arm is especially designed for an amputation through the elbow joint.

Construction.—The forearm is made of wood, shaped to the contours and dimensions of the natural arm, excavated to receive



Cut S 3.



Cut S 4.

Cut S 5.

the stump properly and to reduce weight, covered with rawhide to obtain strength, and finished in enamel. The hand is of rubber, attached to the forearm by either of the methods heretofore described. The palm is provided with a locking arrangement that will hold implements of utility. The elbow joint is of the ginglymoid pattern and is operated by a flexion strap under control of the opposite shoulder. The elbow joint is provided with a locking arrangement that will hold the arm in flexed position when desired. The socket receives the stump, which, on account

of its enlarged extremity, is inserted from the front and held by lacing. Cut S 3 represents an artificial arm practically the same as an S 2, except that the stump is placed in the socket from the rear instead of the front. Cut S 4 represents the same with the hand slipped off and a hook inserted in the end of the forearm. This can only be done when the arm is so constructed that the hand is connected with the forearm by the spindle attachment. In style S 3 the upper section is made entirely of leather, formed on a cast of the stump, modified as the conditions require.

Arms without Hands.—Peg arms for elbow-joint amputations are found useful for laboring purposes. Cut S 5 gives the simplest form. It is without articulation at the elbow. It receives the stump from the front and is held in place by lacing; it may be made of wood, leather, or aluminum. When made of wood it is strengthened with rawhide and enameled. The end of the socket is provided with a wrist plate for holding useful implements. When the conditions of the stump require, a suspender is provided which rests on top of the shoulder and held in place by a strap passing around the body under the opposite arm. The arm, as shown in the cut, is usually made slightly bent at the elbow and approximately the length of the opposite arm. When elbow-joint motion is required it becomes the same as S 4, without a hand.

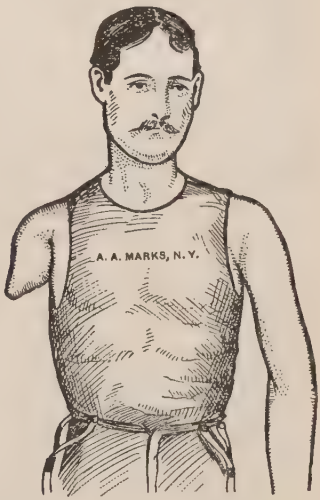
Suspenders are the same as those used on arms for above-elbow stumps.

CHAPTER XXIV

ABOVE-ELBOW AMPUTATIONS

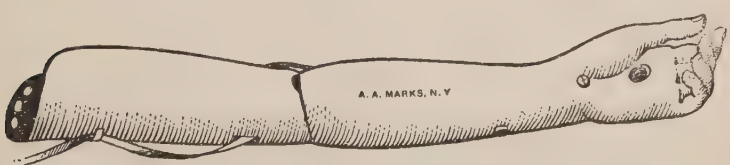
An amputation at any point between the shoulder and elbow produces what is known by surgeons as a humeral stump. Cuts T 1 and T 2 are fair examples.

Cut T 1.



Cut T 2.

Artificial arms suitable for humeral stumps are usually provided with artificial elbow articulations, which are flexed and extended by a swing of the body or by the contraction of the shoulders.

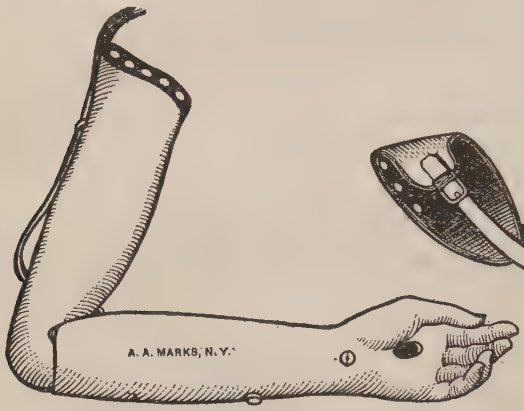


Cut T 3.

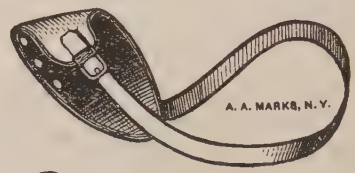
Cut T 3 represents such an arm extended at the elbow, and Cut T 4 represents it with the elbow joint flexed.

This arm is usually constructed of wood, shaped to the con-

tours and dimensions of the opposite arm, excavated to reduce weight, covered with rawhide to add strength, and enameled a flesh-like tint. The hand is of rubber, attached to the forearm by either of the methods heretofore described. The palm is provided with a locking arrangement for holding laboring, eating, and other useful implements. The joints at the elbow are of a



Cut T 4.

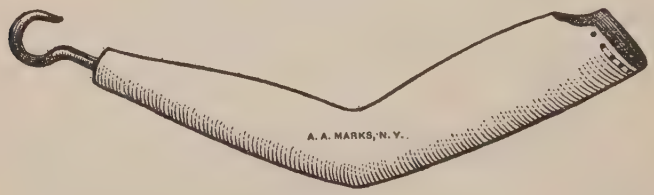


Cut T 5.

substantial character, combined with an attachment that will hold the forearm at one or more desired angles.

Elbow Lock.—The locking arrangement is released by pressure applied to button protruding from the under side of the forearm. Suitable suspender is represented in Cut T 5. This can be renewed, as occasion may require. By an ingenious attachment rotation of the elbow is obtained when length of stump will permit.

Peg arms for upper-arm amputations are of several kinds. Cut T 6 represents the least expensive. It is usually made of wood, excavated to receive the stump properly and to reduce weight, and



Cut T 6.

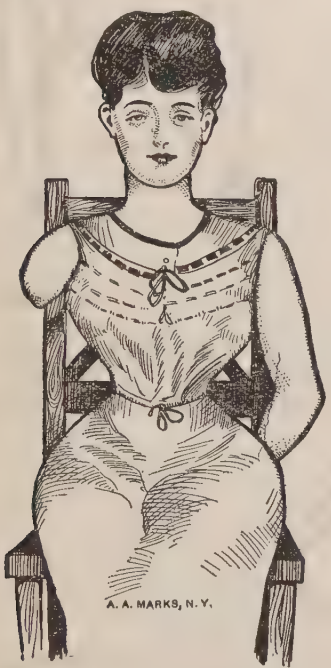
shaped on the outside to have the form and dimensions of the opposite arm. The end of the socket is provided with a catch that will hold implements of utility. This arm is partly flexed and immovable at the elbow, as it is found to be more convenient that way. If a peg arm with elbow-joint motion is wanted, it becomes the same as T 4 without a hand.

CHAPTER XXV

SHOULDER-JOINT AMPUTATIONS

Amputations that are made in the shoulder joints leave short muscle stumps or no stumps at all. They require artificial arms the same as when amputations are between the elbow and shoulder joints.

Cut U 1 represents a shoulder-joint amputation, leaving a muscle stump. Cut U 2 shows a shoulder-joint amputation with



Cut U 1.

Cut U 2.

no stump, and Cut U 3 represents a congenital malformation, the clavicle turned upward at its extremity, affording a knob, or prominence, on which an artificial arm can be securely adjusted.

An artificial arm constructed on the plan of that represented in Cut U 5 is suitable for any of the above cases. The manner in which it is applied and held by body strap is shown in Cut U 4.

Artificial arms are quite necessary in shoulder amputations or

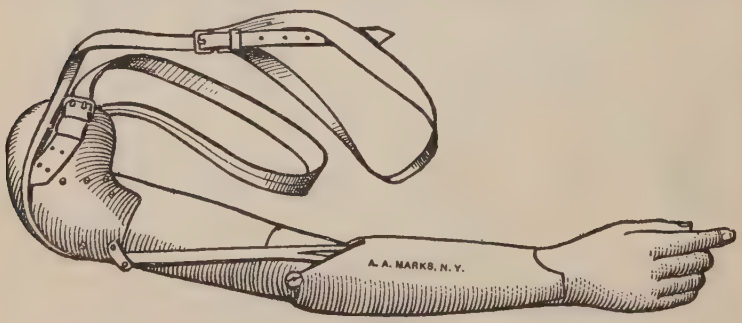
malformations; they keep the shoulders in position, restore symmetry to the body, and provide a means for assisting the other

Cut U 3.

Cut U 4.

arm. By a shrug of the shoulder, the artificial arm is thrown forward, the flexion strap is contracted, and the elbow bends.

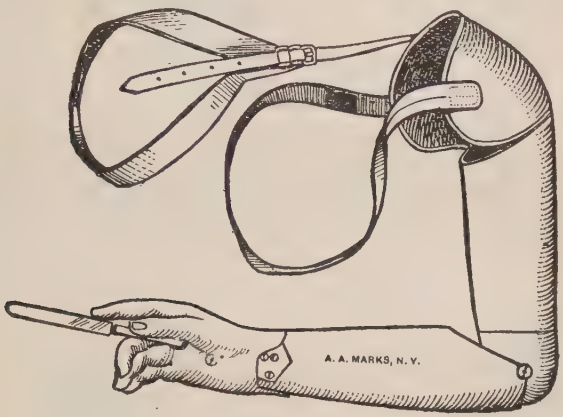
Young persons become very dexterous in manipulating arms under these conditions; they have been known to operate them so skillfully that few persons ever suspect the arms to be artificial.



Cut U 5.

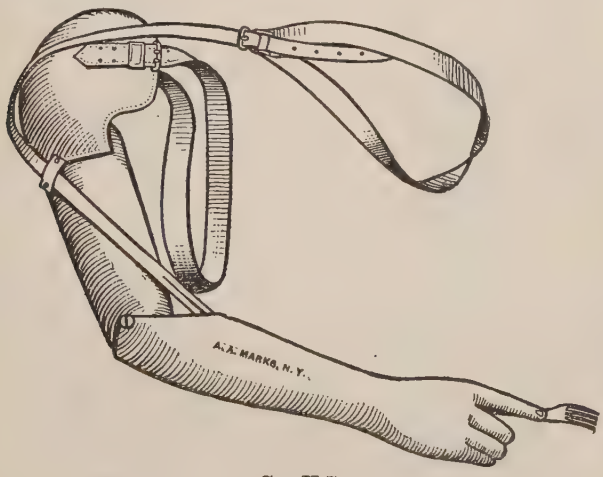
Artificial arms for shoulder-joint amputations are constructed essentially the same as those for amputations between the elbows and shoulders. In addition to the usual stump socket there is a

pad that runs well above the top and over the shoulder, resting on the shoulder close to the neck. The stump is held in position by a strap passing around the body under the opposite arm. The elbow joint admits of flexion and extension, and is provided with



Cut U 6.

a locking arrangement that will hold it at right angles. The attachment can be released by pressure applied to a press-button immediately under the forearm. Cuts U 6 and U 7 represent the arm flexed at right and oblique angles.



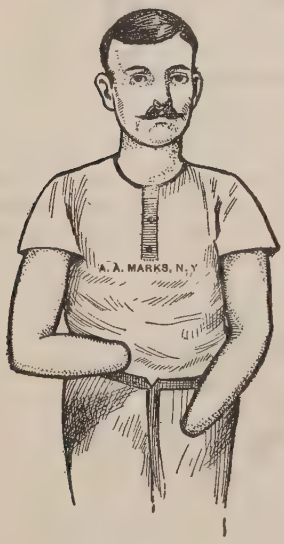
Cut U 7.

Peg arms for shoulder-joint amputations are practically the same as those for above-elbow amputations, and are described in previous chapter.

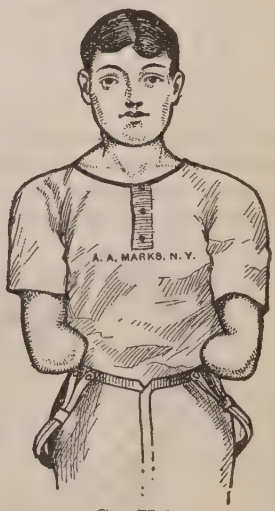
CHAPTER XXVI

DOUBLE ARM AMPUTATIONS

The amputation of both arms is a deplorable loss and presents the strongest appeal to the artificial limb maker. The subject is absolutely dependent upon others unless artificial arms are applied. He is neither able to feed himself, prepare his food, dress himself, or perform labor of any kind. Something must be done to better his unfortunate condition. If not, he is obliged to remain dependent upon some kindly disposed friend or relative. Anything that



Cut V 1.

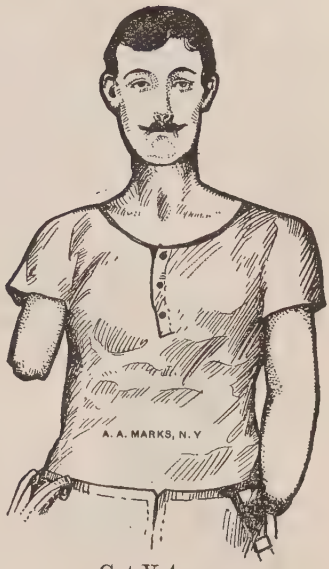


Cut V 2.

will help him in his condition, no matter how little, will be a benefit and will materially lessen the burden on others.

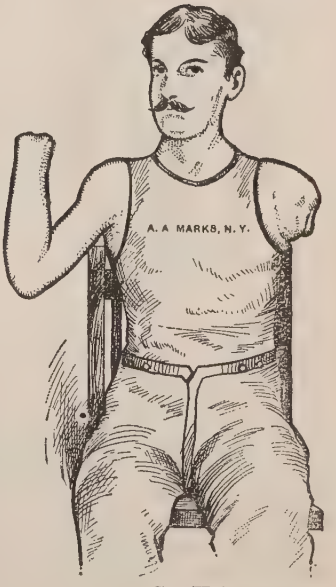
Cut V 1 represents the amputation of both forearms, leaving stumps that are long and powerful. Cut V 2 represents double forearm amputations, stumps short. Cut V 3 shows artificial arms applied. Artificial arms, under control of long and powerful stumps, will enable the wearer to prepare his food at the table, convey it to his mouth, perform labor of a great variety, carry articles of considerable weight, write a legible hand, open and close a door, and attend to the adjustment of his own attire

Cut V 3.



Cut V 4.

Cut V 5.



Cut V 6.

to a reasonable degree. When the stumps are short, the range of utility is correspondingly lessened.

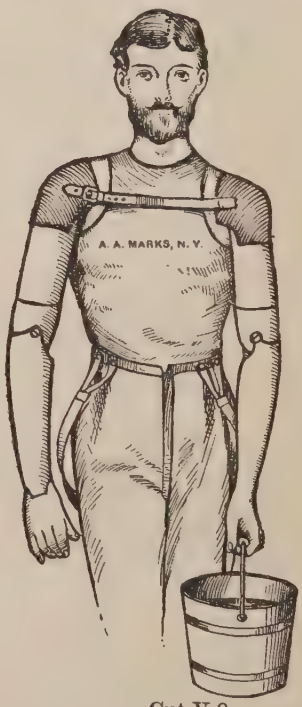
The use of spring thumbs is always desirable in double arm amputations, and unless otherwise instructed, we assume that they are wanted and construct the hands accordingly.

Cut V 4 represents double arm amputations, one immediately above the wrist, and the other above the elbow. Cut V 5 represents similar cases, with artificial arms applied.

Cut V 6 represents amputations of the right hand at the wrist and the left arm at the shoulder. A pair of artificial arms were applied to this case with gratifying results.

The right artificial arm was under control of the natural elbow. The left was secured to the stump by straps with a locking attachment at the elbow and clamp at the wrist. Considerable labor

Cut V 7.



Cut V 8.

was capable of being performed by the right, the left arm depending upon a strap passing around the body for flexion and extension of the elbow.

Cut V 7 represents a young man with both arms amputated above the elbows, the result of a railroad accident. Cut V 8 shows him with a pair of artificial arms applied. As may be surmised, the arms were of very limited use, but, nevertheless, they mitigated his affliction to a compensating degree. By the working of his right shoulder, he was able to bring the artificial forearm to right angles. In this position it would remain, pro-

viding a means by which articles could be laid on the forearm and carried. His left arm could be flexed by means of the stump, which was long and powerful. When at extension, a pail, basket, or valise could be carried, and other services performed. The arms rescued him from a life of absolute idleness.

Cut V 9 represents a man who, while attending his duties on a railroad, was overtaken by a severe storm, and before he could reach shelter, both feet and hands were frozen. It was necessary to amputate the right hand between the thumb and wrist and the left at the base of the fingers and thumb. The great toe was removed from the right foot, and left leg amputated a little above

Cut V 9.

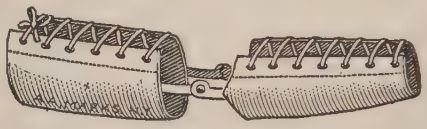
Cut V 10.

the ankle. The same cut shows a pair of artificial hands and an artificial left leg suitable for the case. Cut V 10 represents the limbs applied. Each hand had moving thumbs, which were connected with levers, operated by the forearm. When the stumps were flexed the levers would force the thumbs against the index and middle fingers. When the stumps were extended this pressure was released, and the thumb was permitted to withdraw. An artificial leg was applied to the left side. By these appliances this person was rendered capable of earning his livelihood.

CHAPTER XXVII

APPLIANCES FOR DEFORMITIES, EXCISIONS, WEAKENED JOINTS, ETC.

In cases of ununited fractures of either bone of the forearm or of the elbow joint or upper arm, it is necessary to apply a brace constructed upon durable lines and capable of being removed and readjusted as conditions require. Cut W 1 shows an apparatus for an ununited fracture. The forearm and muscle parts are con-



Cut W 1.

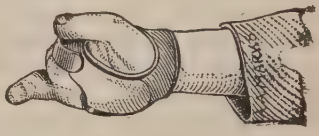
structed of material sufficiently firm to serve the purpose. They are connected by articulating joints that work in harmony with the elbow, or supply the elbow motion; the parts are adjustable by lacing, they hold the bones in place and give strength and firmness

Cut W 2.

to the fractured member. Cut W 2 represents an apparatus for elbow-joint resection or for dislocated shoulder joint. The forearm and muscle parts are made of suitable material and are connected by steel joints. The muscle part is provided with a hood, which

Cut W 3.

Cut W 4.

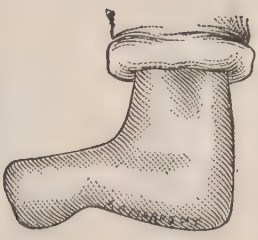


Cut W 5.

rests comfortably upon the shoulder. When necessary, a strap connected with the hood is passed around the body, holding the appliance firmly in place.

Cut W 3 represents a hand mutilation, the subject being a sailor, requiring an appliance that would enable him to hold a rope, tie a knot, climb the shrouds, and carry articles about a vessel. Cut W 4 represents a socket composed of canvas, rubber,

Cut W 6.



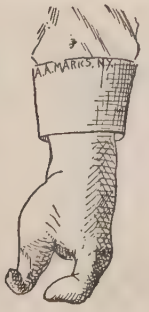
Cut W 7.

Cut W 8.

and leather, formed to fit the mutilated hand, with apertures to admit the passage of the remaining fingers; a steel, flattened hook was riveted between the apertures. Cut W 5 represents the apparatus applied, which proved to be useful and satisfactory.

Cut W 9.

Cut W 10.

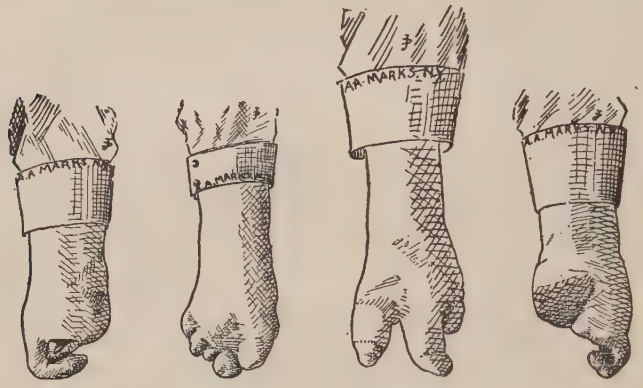


Cut W 11.

Cut W 12.

There are many cases of deformities, resections, etc., of the upper extremities that can be treated practically the same as amputations. They require artificial parts that incase the weakened members and strengthen them.

Hands and parts of hands are attached to malformed members so as to correct the deformity and supply the want to a degree sufficient to make the remaining parts useful. Cut W 6 represents a deformity of the forearm, the elbow joint possessing normal conditions. This deformity case was treated as an amputation below the elbow, adjustments to meet the peculiarities of the

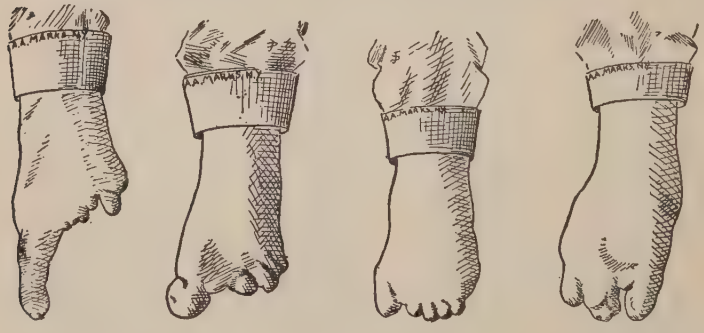


Cut W 13. Cut W 14. Cut W 15. Cut W 16.

stump. Cut W 7 represents a deformity of elbow joint and forearm, a very slight movement remaining in the elbow, the forearm terminating in an enlargement. An artificial arm, constructed similar to one for wrist-joint amputation, was made and applied.

Cuts W 8 to W 20 represent congenital deformities of the hands.

In these cases, the conditions being somewhat similar to ampu-

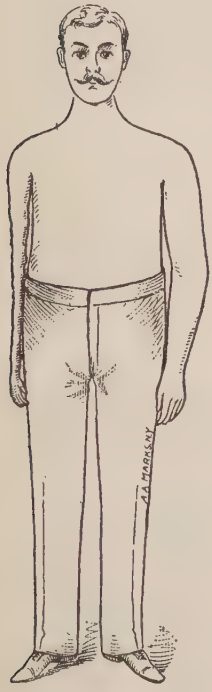


Cut W 17. Cut W 18. Cut W 19. Cut W 20.

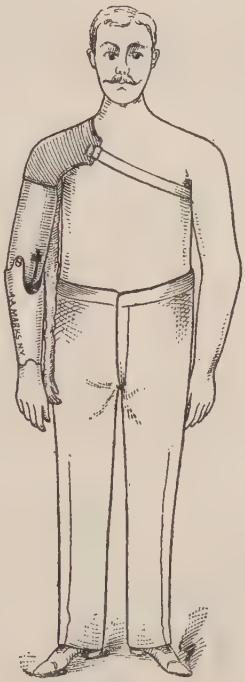
tations, artificial hands for partial hand amputations, as illustrated and described in Chapter XX., were applied.

Cut W 21 represents a European prince of distinguished lineage. When an infant, he fell from his nurse's arms, paralysis of

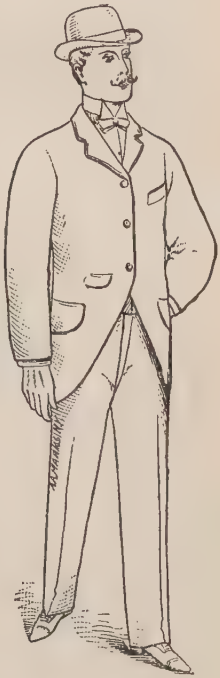
the right arm followed. As he grew to manhood, the affected member grew in length, but failed to develop in size. It was limp and useless. In 1893 he came to us, and, upon examination, we found that the entire right side of the thorax was undeveloped, and that an artificial arm could be applied without producing noticeable disproportion. The case was treated the same as a shoulder-joint amputation, and an arm constructed accordingly was attached outside the withered member. The supporting part covered a great area of the shoulder, chest, and back; this held



Cut W 21.



Cut W 22.



Cut W 23.

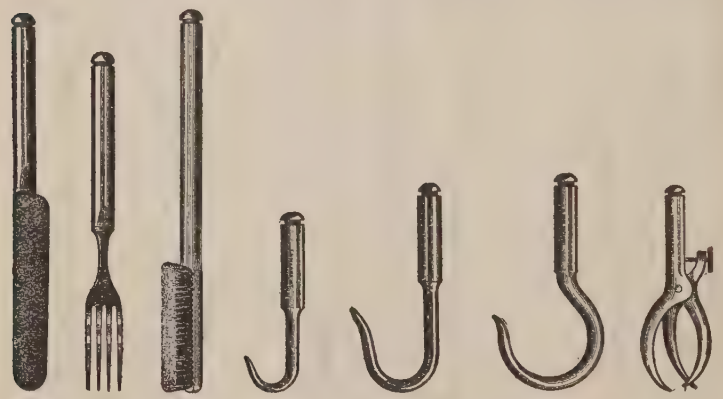
the artificial arm in place, as shown in Cut W 22. In dressing, the withered arm was (as had always been the custom) permitted to rest close to the body, the clothing was placed between the artificial and the withered arm, and, when dressed, the prince presented an appearance that was beyond criticism, as shown in Cut W 23.

CHAPTER XXVIII

ARM IMPLEMENTS

Implements for artificial arms are of endless variety: hooks, knives, forks, clevises, claw-hooks, pincers, clamp rings, are a few of the many devices that have been made for persons whose occupations demand something aside from the usual line. Each arm we make is supplied with a hook, knife, fork, and brush. These are included in the cost. Additional implements are furnished when desired, and if a customer desires one made to order for any special purpose, we will gladly make it for him. Our charges for the same will be moderate.

Cut X 1 represents a table knife, Cut X 2 a table fork, Cut X 3 a hand or nail brush; these are fitted to slip in the palm of



Cuts:

X 1. X 2. X 3. X 4. X 5. X 6. X 7.

hand or in the end of the forearm. They are of great assistance at the table and in washing the opposite hand.

Cuts X 4 and X 5 are hooks to be carried in the palm of the hand or in the end of the forearm. They are made with straight shanks, so that they can be received in the palm, are of two sizes, large and small, as shown in the illustrations.

Cut X 6 is a round hook, to be used in the end of the forearm. The curved back prevents it being placed in the palm of the hand. Cut X 7 is a claw hook, to be used in the end of the forearm. One part is made with two prongs and the other with one; it can

be opened, closed, and set. This device enables a mechanic to clasp a tool with firmness.

Cuts X 8 and X 9 show rings which can be placed in the end of the forearm. One is immovably attached to the shank, and the other is loose; either is serviceable for mechanics and farmers. Through the ring the handle of a tool, or farm implement, can slide, while the tool is directed by the opposite hand.

Cut X 10 shows a clevis to be used for holding shop or farming implements. A quarter-inch hole must first be bored through the handle of the tool to be held, then the pivot pin unscrewed and the clevis placed over the handle, the pivot pin passed through one tine of the clevis, through the hole in the handle, and then

Cut X 8.

Cut X 9.

Cut X 10.

Cut X 11.

Cut X 12.

screwed into the other tine. This will hold the tool in an accommodating way, and permit it to swivel.

Cut X 11 shows a light laboring implement, somewhat on the order of pinchers, to be used in the end of the forearm. The jaws are opened by a leather strap running up the arm, connecting with the opposite shoulder. When the artificial arm is extended the strap is pulled upon, and the jaws of the pinchers open. When the arm is flexed the pull on the strap is released, and the spring in the handle of the pinchers forces the jaws together, holding whatever may be placed between them.

Cut X 12 shows a similar implement combined with a hook.

CHAPTER XXIX

UTILITY

Although claim is not made that an artificial arm possesses functions comparable to those of the natural, it is contended that a reasonable and a compensating amount of utility is assured.

The wholesome effect an arm has on the stump, that of keeping it in a healthy and vigorous condition, protecting it from injuries, forcing it into healthful activity, together with its ornamental aspect, are sufficient reasons for wearing one, even if utility is totally ignored.

As before stated, there are persons who have more aptitude than

Cut Y 1.

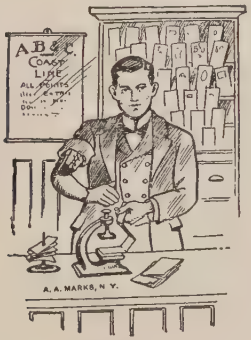
others. Some with very short stumps do more than others with long ones.

Notwithstanding how short a stump may be, there is always a possibility of its controlling an artificial arm to advantage. If one person can use an arm on a short and difficult stump, there is hope that every person can do likewise, no matter what length or kind of stump he may have.

A few cases are presented, to give some idea of the scope of the value of artificial arms from the utility point of view.

Cut Y 2.

One of our lady patrons is an amanuensis. While she is holding and guiding a pen with her rubber hand, she is keeping the paper from sliding on the desk with her natural hand. She writes



Cut Y 3.

Cut Y 4.

quickly and legibly and earns her livelihood by that employment. Cut Y 1 represents her at the desk.

One of our patrons, a physician, who is engaged in general country practice, wearing an artificial arm for amputation below

the elbow, finds his rubber hand convenient and valuable in holding the reins of his horse while driving. (See Cut Y 2.)

Mr. Woolley, of Ohio, is a ticket agent at a railroad station.

Cut Y 5.

He has held the position for a number of years to the satisfaction of the company. He holds tickets in his natural hand while he operates the stamp and dating machine with the rubber one. (See Cut Y 3.)

Cut Y 6.

Cut Y 7.

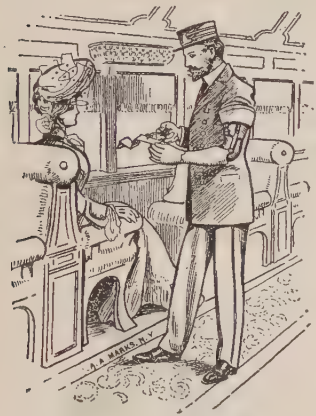
W. G. Bray, of Dunklin County, Mo., lost his arm below the elbow some years ago. He has worn an artificial one since. He is a clerk in a store and has to handle all kinds of heavy mer-

chandise. He handles a wheelbarrow to advantage. (See Cut Y 4.)

Cut Y 5 represents a customer who uses his rubber hand in rowing a boat; he is a farmer, located on the banks of a river, and finds it necessary to cross the stream frequently.

Mr. Ely, of Windham County, Conn., has no difficulty in working with other laborers and earning laborer's wages, although he has to do a great amount of work with the pickax. His right arm is artificial. (See Cut Y 6.)

A physician in Michigan writes that his patient, for whom he bought an artificial arm, has learned to operate the key of his



Cut Y 8.

Cut Y 9.

telegraph apparatus very skillfully with his rubber hand. (See Cut Y 7.)

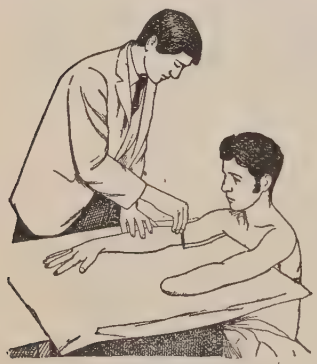
The accompanying Cut Y 8 portrays a railroad conductor who wears an artificial arm and holds the ticket in his rubber hand while he operates the punch with the other.

A patron, residing in Providence, wears an artificial arm on a short shoulder stump; he could not be induced to do without it; it exercises his shoulder, improves his appearance. He finds the rubber hand a great convenience in holding cards while playing whist, a game he is greatly attached to. (See Cut Y 9.)

CHAPTER XXX

DIRECTIONS FOR TAKING MEASUREMENTS FOR ONE OR A PAIR OF ARTIFICIAL ARMS

Place a sheet of paper (about twenty or thirty inches) on a smooth table, remove all clothing from the upper part of the body, and place both arm and stump on this paper at full length. Be sure that the edge of the paper presses closely against the chest. Pass a long pencil down the inside of the arm (Cut Z 1), around the fingers, and up the outside to the shoulder. Then pass the pencil around the amputated side, from body around end of stump, and up to the shoulder (Cut Z 2). Bend the elbow of the sound arm to about right angles, mark from the shoulder around the elbow, down the forearm, around the hand, up the inside



Cut Z 1.

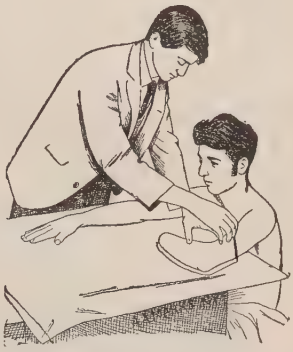
Cut Z 2.

to the shoulder (Cut Z 3). Bend the elbow of the amputated arm to right angles and mark around it, from the shoulder to the end of the stump (Cut Z 4). If these diagrams are correctly made, they will resemble Cuts Z 5, Z 6, Z 7, and Z 8.

With a tape line measure the distance from the point of shoulder to the point of elbow of the sound arm, also the distance from the armpit to the bend of elbow (indicated by dotted lines in Cut Z 7). Measure the distance from the point of the shoulder to the point of the elbow of amputated arm, also the distance from the armpit to the bend of elbow. Give the circumference of each arm at points two inches apart, beginning close to the body. These circumferences are represented by dotted lines A, B, C, D,

E, and F of sound arm, and the dotted lines A, B, C, D, E, F, G, and H in the diagram of the stump (Cut Z 5). Then give the circumference of the hand at the base of the thumb, the circumference of the palm at the base of the fingers, the circumference

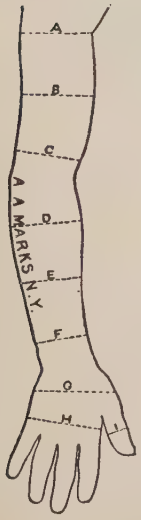
Cut Z 3.



Cut Z 4.

of the thumb at the first joint, represented by dotted lines G, H, and I (Cut Z 5).

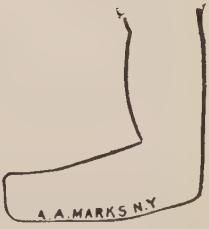
If one arm is amputated in or above the elbow, the diagrams



Cut Z 5.

Cut Z 6.

Cut Z 7.



Cut Z 8.

and measurements of the sound arm called for by Cuts Z 5 and Z 6 are required, and only one diagram of the stump, together with circumferences at places two inches apart, the distance from

point of the shoulder to the point of the stump and from armpit to the point of the stump are also required.

If both arms are amputated above the elbow, diagrams of each stump, and the distances from the point of each shoulder to the point of each stump, and from armpit to the point of each stump are required, also the circumferences of each taken at points two inches apart.

If both arms are amputated below the elbows, the diagrams and measurements may be taken as suggested by Cuts Z 6 and Z 8.

All amputations in the shoulders, elbows, or wrists, or in the hands, leave extremities that are bony, more or less sensitive, requiring very exact fitting. Such stumps should be reproduced in plaster.

Answers to the following questions should be attached to the blank and forwarded with every order: Name of patient? Post-office address? Occupation? Age? Cause of amputation? When was amputation performed? Which arm amputated? Has the patient worn an artificial arm? If so, whose make? Name of

Cut Z 9.

Cut Z 10.

party ordering? His address? Is the arm to be made and fitted from measurements in the absence of the wearer? To what address shall it be shipped?

Plaster casts of arm stumps are only required in amputations in the wrists, elbows, shoulders, and in the hands, and in other cases when there are peculiarities that cannot be clearly indicated by the diagrams. A dentist, wax flower maker, or plaster statuette maker is familiar with the manipulation of plaster, and if one is available he should be employed for the purpose. The operation, however, of taking a plaster cast is not difficult, and can be done by almost any person.

The simplest method is as follows: Remove all clothing, shave away all hair, or stick it down with glue, paste, thick plaster, or thick soap. Then place about two quarts of plaster of Paris in a basin containing one quart of water, stir it up thoroughly, so that the plaster will become pasty. Then spread it upon the stump, until it is entirely covered with at least one-half an inch in thickness. The stump should be kept very quiet until the

plaster has become hard, at which time it can be withdrawn, and the plaster will form a mold of the stump. This can be sent to us, or, if preferred, the inside can be greased and filled up with slaked plaster of Paris, which, when hard, can be taken from the mold.

If the end of the stump is large, or if there are prominences on the stump, it will be necessary to make the mold in two parts, so that they can be separated when hard, and the stump removed. The simplest way is to spread a little slaked plaster on the table, lay the stump upon it, pressing it down until it sinks half way into the plaster (see Cut Z 9). Then lay pieces of thin, wet paper all over the exposed surfaces of the plaster. Then pour and

Cut Z 11.

Cut Z 12.

spread plaster on the top of the stump (Cut Z 10). Let the plaster run down the sides on the paper. The stump should be covered with at least one-half inch in thickness. When it has become thoroughly hard, the piece of paper will permit the plaster to separate and the stump can be withdrawn. The mold thus produced can be sent to us, or, if preferred, a plaster facsimile of stump can be made from it, by first speading oil or grease in the mold, then placing the two parts together, tying them by a string; then mix plaster of Paris to about the thickness of cream and pour it inside the mold. When this has become hard, the mold can be separated and the cast withdrawn.

ARMS FITTED FROM MEASUREMENTS

Artificial arms can, as a rule, be fitted from measurements and diagrams, while the wearers remain at home. The same reasons that are given for fitting artificial legs from measurements apply to arms. The guarantees that we give protect the ordering party in the strongest possible way. Should an arm fail to fit acceptably, when made from measurements, it may be assumed that the stump has changed, or that there are peculiarities about the stump which have not been made known. No matter what conditions may be

responsible for such misfit, the arm can be returned, with particulars, and all the needed alterations or reconstructions will be made by us without charge, or, if the wearer desires, he can at that time call upon us and have the arm refitted and readjusted directly to his stump. It will thus be seen that the conditions under which fittings are made from measurements are entirely in the interest of the wearer. As a rule, fitting from measurements results in saving the party expense, annoyance, and loss of time in traveling.

CHAPTER XXXI

PRICES, ACCESSORIES

Artificial Fingers for Partial Hand Amputations, described on pages 194 to 197	Cut P 9	each	$30.00
	Cut P 10	"	30.00
	Cut P 23	"	50 00
	Cut P 24	"	50 00
	Cut P 25	"	50.00
	Cut P 26	"	50.00
Artificial Hands for Partial Hand Amputations, described on pages 197 to 198	Cut P 38	"	50.00
Artificial Arms for Wrist-Joint Amputations, described on pages 199 to 201	Cut Q 8	"	35.00
	Cut Q 9	"	35.00
	Cut Q 10	"	35.00
	Cut Q 11	"	35.00
	Cut Q 16	"	50 00
Artificial Arms for Forearm Amputations, described on pages 202 to 206	Cut R 7	"	50 00
	Cut R 8	"	40.00
	Cut R 13	"	50 00
Peg Arms for Forearm Amputations	Cut R 14	"	30 00
	Cut R 15	"	40.00
Suspenders for Forearm Amputations	Cut R 16	"	2.00
Artificial Arms for Elbow-Joint Amputations, described on pages 208 to 210	Cut S 2	"	75.00
	Cut S 3	"	75 00
Peg Arms for Elbow-Joint Amputations	Cut S 4	"	65.00
	Cut S 5	"	50 00
Artificial Arms for Above-Elbow Amputations, described on pages 211 and 212	Cut T 3	"	75.00
	Cut T 4	"	75 00
Suspenders for Above-Elbow Amputations	Cut T 5	"	2 00
Peg Arms for Above Elbow Amputations	Cut T 6	"	50.00
Artificial Arms for Shoulder-Joint Amputations, described on pages 213 to 215	Cut U 5	"	75.00
	Cut U 6	"	75.00
	Cut U 7	"	75.00
Appliances for Deformities, Excisions, Weakened Joints, etc., described on pages 220 to 223	Cut W 1	"	50.00
	Cut W 2	"	50.00
	Cut W 4	"	25.00
	Cut W 22	"	75.00
Arm Implements	Cut X 1	"	.75
	Cut X 2	"	.75
	Cut X 3	"	1.25
	Cut X 4	"	1.25
	Cut X 5	"	1.25
	Cut X 6	"	1.25
	Cut X 7	"	5.00
	Cut X 8	"	2 00
	Cut X 9	"	2 50
	Cut X 10	"	3.00

Cut X 11	"	8 00
Cut X 12	"	9.00

Accessories.—Artificial arms for wrist-joint, forearm, elbow-joint, above-elbow and shoulder-joint amputations will be accompanied, free of charge, with necessary suspenders, sock for the stump, knife, fork, hook, brush, pair of kid gloves, etc.

Peg arms for the above amputations will be accompanied with all the above-mentioned articles except gloves.

CHAPTER XXXII

TERMS OF PAYMENT, INSTALLMENT PAYMENTS, GUARANTEE

Advance Payment Avoids Delay.—An article so important as an artificial leg or arm, which has to be made expressly to order for the person who is to wear it, should be paid for in advance. Time and expense are saved by doing so. If, however, objection is made to paying the full amount in advance, one-half the value can be forwarded with the order and the balance paid on delivery.

How to Make Payments.—Remittances can be made by bank draft on New York, by postal money order, by express money order, or by money package by express. All drafts should be made payable to the order of A. A. Marks.

Our Reliability.—Every assurance is given that the interests and the welfare of the wearer will be subserved in every detail. Our reliability and business and financial standing can be ascertained by consulting any mercantile agency.

Success Most Important to Us.—It is of the greatest importance to us that every client shall be satisfied, not only with the fitting and construction of his artificial limb, but that he shall become clever, skillful, and dexterous in its use. He must do this in order to reflect credit on our skill. We take as much pride in the successful results of our work as do our clients.

As manufacturers, we cannot afford to neglect, or hastily dismiss a case, or show a lack of interest, or the least hesitancy in doing everything that is possible for the relief and comfort of our patrons. Wisdom compels the strictest integrity in the discharge of every obligation. Trouble and expense are not to be considered when disappointment and displeasure can be averted. No establishment can exist long that becomes careless, or allows its conduct to be criticised or impugned.

Advanced Payments Are in the Interest of the Wearers.—Payments in advance may be looked upon by some as arbitrary and unreasonable, but by the man of business they are viewed in the proper light, and not objected to. As a matter of fact, the best and most skillful services are always paid for in advance. If you wish to send a letter, you must attach a stamp to the envelope, and the stamp must be paid for when purchased, before the letter is delivered. This may appear to be a small matter, but to publishers and business men who have large correspondence, it amounts to hundreds of dollars every day. If you wish to send a telegram, you must pay for it in advance. If you want a telephone in your

house, you must pay a month's fee in advance. If you wish to travel by land or sea, you must buy your ticket before you start; not after you have finished your journey. If you want a Lorenz to perform a surgical operation, you must pay him before he leaves his home. If you want a Makart to paint your portrait, you must pay him before he will entertain your order. And so it goes, the world over. The best talent and the most skillful services are only obtainable by paying in advance for them. The richest men—the most reputable merchants—have always to yield to these terms when they seek the best.

The same can be said of artificial limbs. The best can only be obtained by meeting the maker's terms. The poorest, those made by the inexperienced, can be obtained upon any terms that the purchaser may wish to make.

The question then resolves itself into whether the applicant prefers to get the best limb, and pay for it in advance, or whether he is willing to put up with the product of an unskilled maker, merely to have his notion indulged regarding payment.

Artificial Limbs on Trial, Prejudicial to Success.—It has been said that "things that are not paid for are good for nothing," and, as a matter of fact, articles that are constructed and sold under the consideration that they can be accepted or rejected, are, as a rule, rejected. It is safe to estimate that at least seventy-five per cent. of the artificial limbs that are made and delivered by small, inexperienced, and eager manufacturers, with the understanding that they can be tried for a reasonable length of time, and if not satisfactory, can be returned, are thrown back on the hands of the maker, and as these terms are only allowed by the maker of small means, he cannot afford to lose the time and material expended in the rejected limb. He, therefore, makes some slight alterations in the limb, and passes it to the next victim. There is, therefore, a strong probability, when placing an order with a manufacturer who permits his work to be returned, of getting a limb that was originally made for some other person.

Why Correctly Made Limbs are not Always Pleasant at the Start.—An artificial limb, no matter how scientifically it may be made and correctly fitted, is not a very comfortable article to wear during the period required to get accustomed to it. During this time there are many moments of discouragement. The stump, being weak, soon tires and fails to control the limb, and because of this weakness, the wearer gets discouraged and either concludes that the limb has not been properly made and fitted, or that his stump is of a character that will never control one. If the leg is not paid for, it will in all probability be rejected and returned to the maker during one of these periods when the wearer is in a discouraged frame of mind.

Patient Endeavor Brings Its Reward.—If, on the other hand, the limb is paid for, the effort to wear it will be repeated again and again, until finally the task is accomplished, and the services derived will prove to be valuable beyond calculation. Viewing the

subject in this aspect, it will be seen that the fact that the limb is paid for has a stimulating effect on the wearer, impelling him to put forth further effort.

Money Deposited in Banks Not Acceptable.—The proposition to place money for the payment of the limb on deposit with some bank, to be paid to us as soon as the limb is received and found satisfactory, is often made. We invariably decline to accept such terms, as money deposited is subject to such conditions that the feature of security is removed. The money cannot be drawn, unless the party ordering the limb gives his consent. If he declines to accept the limb from caprice, or hasty judgment, he can demand his money, and we have no redress.

Installment Payments.—We are willing to accept payments on the installment plan to accommodate those in indigent circumstances, provided such obligations are imposed as will make the payments absolutely sure from the legal point of view. On an order for an artificial leg the first payment must be at least one-third its value, and for an artificial arm, one-half its value; and this amount must accompany the order. The balance can be paid in large or small amounts—weekly, monthly, or at other periods—as may be desired. Deferred payments must be secured by the indorsement of a reliable business person who has an acceptable mercantile rating.

Deferred Payments Must Be Guaranteed.—The deferred payments can be made by promissory notes, one note for each payment, signed by the party ordering the limb, and also by the party offering himself as security, or they can be secured by a letter written by the party guaranteeing the payments. The following is an example that will be acceptable:

Place.....Date.....

A. A. Marks, New York:

Dear Sir—Mr. ..... desires to procure from you an artificial leg, and wishes to pay for the same in the following manner: ..... dollars will be advanced with the order and ..... dollars will be paid at the rate of ten dollars per month, beginning one month after the delivery of the leg.

In case of failure to meet the payments as agreed, or in case of default due to any cause whatsoever, you may hold me responsible, and upon demand I will pay the same to you.

Signed .....

Post-office address, ... Occupation, ...

Acceptable Guarantors.—We know no mercantile agency that quotes the financial standing or business liability of professional men, such as ministers, lawyers, doctors, farmers, retired men, employees, or agents. Mercantile agencies only give the standing of credit of those who are actually engaged in commercial or manufacturing industries. For this reason, we require the signature of a person engaged in business.

We believe there are but few dishonest persons; those whose motives and impulses are entirely void of integrity. Promises are made in good faith, but because of inability to keep them, they frequently go by default. A man without means, and being in need of an artificial leg, will assume almost any obligation, in order to procure one. He has the promise of a situation as soon as he can go without crutches. The future is promising and bright. He will go to his minister, or to his doctor, or his legal adviser, and as a rule, he will receive his favor. The clergyman or the doctor will promise to go security for him. The limb is obtained; the man wears it; he gets the situation, and earns fair wages; he becomes a little careless in his expenditures, or some relative or friend becomes afflicted and requires some financial help from him. The time arrives for payment to be made, and the young man has no money. The minister, or the doctor, who has guaranteed the payments, feels that it is unjust to be called upon to make payments. He writes a pitiful letter, and time is extended. This is repeated until patience becomes exhausted, and drastic measures have to be resorted to. It suddenly dawns upon the manufacturer that it would be poor policy to force payment out of the minister, or to make enemies with the doctor, and the matter is dropped, the manufacturer suffering the loss.

This is an old, old story, so often enacted in life that the manufacturer has been forced to accept no guarantors, except men engaged in business who have acceptable mercantile standings, and are prepared to meet losses, should the party default.

Our Guarantee.—Every artificial leg or arm delivered by us is accompanied by a guarantee giving the assurance to the wearer that the artificial limb is constructed of the best material, and in a thoroughly workmanlike manner, and if any defects present themselves, we obligate ourselves to remove them without charge, provided the limb is delivered to us as soon as the defects have become known, and before the limb has become further damaged on account of being worn when out of order. The guarantee covers a period of five years from date of delivery.

It is well to note that the guarantee does not obligate us to keep the limb in repair for five years, irrespective of accidents, improper treatment, or extraordinary wear.

CHAPTER XXXIII

PENSIONERS OF THE UNITED STATES ARMY AND NAVY FURNISHED WITH ARTIFICIAL LIMBS AT GOVERNMENT EXPENSE

THE ORIGINAL LAW.—It has been the purpose of the United States Government, since the early part of the Civil War (1862), to furnish artificial limbs to those who lost their natural ones from injuries received while in service. The first law, passed in 1862, gave one limb for each amputation, and to soldiers and sailors only. It was soon amended so as to include officers.

THE AMENDED LAW.—In 1870, a new law was passed, which increased the number of those entitled to artificial limbs, and repeated the issue every five years. This law was in force for twenty years.

THE NEW LAW NOW IN FORCE.—In the early part of 1891 Congress enacted additional pension laws, and added to the list hundreds of thousands of soldiers who had never before received pensions, and who had never dreamed of receiving any. The same Congress adopted measures by which additional benefits were given to the beneficiaries of the artificial limb laws. The old law was amended so that the issue was changed from five to three years. This was done not because soldiers required new limbs so frequently, but as an additional gratuity to the maimed. The law, as amended, reads as follows:

"Every officer, enlisted or hired man, who has lost a limb or the use of a limb in the military or naval service of the United States is entitled to receive, once every three years, an artificial limb or apparatus. The period of three years is reckoned from the last maturity subsequent to March 3, 1888."

TRANSPORTATION FREE.—"Necessary transportation to the manufactory and return, by the most usual and direct route, will be furnished to those desiring to be fitted personally. Sleeping car accommodations will be given on request."

Those whose maturity under the old law occurred between March 3, 1886, and March 3, 1888, were given a new date: namely, March 3, 1891 (the day the bill became a law).

THE BOND.—As manufacturers to the United States Government, we have met the requirements of furnishing bonds with two sureties, of five thousand dollars each, for the faithful performance of our work.

The favor with which our methods of constructing artificial legs and arms is esteemed by the soldiers is exceedingly complimentary, and we feel under obligations to them.

A blank application for an artificial limb and transportation will be sent upon request. The same can be filled out, signed, and mailed to us. As soon as we receive it, we will ascertain the date that the applicant will be entitled to a new limb, and at the proper time will pass the application to the proper officials.

Those who reside at a great distance, and do not care to travel, can remain at home and have their limbs constructed and fitted from measurements. We extend to them every protection, every assurance, every guarantee, and assume every risk, exactly as we do to civilians.

We have on file the measurements, diagrams, records, and dimensions of all the artificial limbs made by us since the founding of our house, and can duplicate any limb at any time.

If a soldier wishes to have a limb duplicated, he will not be required to send any additional measurements.

We advise pensioners to procure artificial limbs under the laws, and apply for them promptly upon the maturity of their claims, and lose no time.

When Congress makes changes in any law, the law in force up to that time becomes null and void. No one can predict what Congress will do, any more than he can predict what public sentiment will be on any issue. Should a party clamoring for extreme economy in the administration of public affairs become dominant, there is no telling what would be done in cutting down allowances.

ADVANTAGES IN REGISTERING WITH US.—As pensioners seldom keep records concerning themselves, we make it a point to notify them a little prior to the date of their maturity. Any change, or threatened change, in the law affecting the issue of artificial limbs is watched by us and communicated immediately to those on our records whom the law may affect. It is, therefore, to the advantage of the pensioner to keep within touch of us; to inform us of his change of address, and to see that our records are complete, so far as rank, company, regiment, number of pension certificate, etc., are concerned.

CHAPTER XXXIV

CHEAP ARTIFICIAL LIMBS

From the International Journal of Surgery

Cheaply Made Limbs Not Safe.—From time to time the newspapers chronicle severe accidents happening to the wearers of artificial limbs as the result of faulty construction. Here is an instance taken from the Cincinnati *Enquirer* of December 19, 1901:

"Fred Rentz was severely injured last evening, about five o'clock, by falling on the street at Central Avenue and Liberty Street. His fall was due to a cork leg breaking. The unfortunate man was taken to a hospital by Patrol No. 5."

Inviting Disaster.—There is material in this brief item for profound thought on the part of every man who has occasion to require an artificial leg. There is material, too for a sermon on the iniquity of dealers who sell artificial limbs of inferior or defective workmanship. That there are many persons who commit the folly of risking their bodies, and possibly their lives, upon poorly made limbs for the sake of the few dollars saved thereby, and that there are dealers who are willing to encourage them in this folly, may be proved to the satisfaction of anyone who will read the daily papers carefully. Every few days cases are reported similar to the above, and in almost every case the disaster may be traced to the same cause—poor material or inefficient workmanship.

Mr. Rentz undoubtedly wore a cheap leg—cheap in construction, but very costly in the price he ultimately paid for it in money, suffering, and lost time. Some weakness in the wood or leather or steel (there is no cork in any artificial limb) was revealed by an accidental slip which brought an unusual strain upon it, and caused it to give way just when he had most need to rely upon it. The saying that "no chain is stronger than its weakest link" applies with the fullest possible force to an artificial leg. Every part may be perfect except one, and yet that one is certain to precipitate a fall of serious if not fatal results.

The adage that "the best is the cheapest" applies to almost everything that one may require. It applies without exception to the purchase of artificial limbs. The steeplejack will not make use of a cable unless he knows that it has been tested and proved to be capable of sustaining the weight that he will bring to bear upon it. The caisson worker will not descend below the bed of a river unless he is assured that the air-pumps are in perfect working order. No more should the wearer of an artificial limb trust him-

self upon it unless proved material, skill, and honesty have entered into its construction.

Confidence Necessary to Success.—The essence of success in walking with an artificial leg is confidence. To learn to manipulate the limb is a very simple matter, but unless the wearer knows that he can rely upon it as thoroughly as he would upon his natural legs he will never be able to walk well or to move about with a sense of perfect freedom. There are thousands of persons walking about to-day on Marks' artificial legs whose intimate friends are not aware that they have lost any of their natural members. They do not limp or hobble, and they do not find the slightest difficulty in moving about as freely as their most active neighbors—all because they have confidence; they know that every bit of material that enters into the leg is carefully tested and proved before it is used, and that, therefore, it cannot possibly give way under ordinary use or at some critical moment when they most need its support.

A vast amount of care and trained ability enters into the construction of a thoroughly reliable artificial leg, foot, or arm. It will not be sufficient to use ordinary material, or even the best material that can be bought through the ordinary channels of trade.

Selection of Material.—As the first step in the manufacture of the artificial leg, an expert visits the woods and selects the tree from which the material is to be cut. To do this is no easy matter, and requires long experience. The tree must be neither too young nor too old. It must be free from knots and must have a firm, even grain that it will be equally strong in every part.

When the tree has been felled it must be cut into lengths and carefully split into sections, use being made only of the main body of the tree trunk in which the grain is firm and even. Only a small portion of the ordinary tree is available for this purpose.

When the wood has been thus carefully selected, it is by no means ready for use. It must then be kiln-dried, so as to be thoroughly shrunk before it can be utilized. About four years is required in this process before the stick of timber can be manufactured into an artificial leg.

It is not the wood alone that is selected with such careful attention to its strength and wearing qualities. The steel which goes to form the braces and joints of the leg is first carefully tested to detect the existence of any flaws or defects and to prove that it is capable of carrying a larger weight than it will be called upon to support.

The leather for the jacket which forms the upper part of the leg is selected with equal care. Only the strongest and most valuable parts can be used; the rest must be thrown away or used for some other purpose. The buckskin lacings are also a matter of solicitude, and are subjected to thorough tests to determine the weight they will sustain.

Even a more delicate matter is the proper vulcanizing of the rubber foot which plays an important part in every successful artificial leg. The elasticity of the foot depends upon the exact

degree of heat applied to the rubber. Thus, at every step in the selection of material, the greatest care and judgment must be exercised.

The need of practical experience and expert judgment does not end with the selection of materials. Equal skill is needed to assemble them properly. An artificial leg, to be a source of comfort and usefulness to its wearer, must fit perfectly, and no two persons can be fitted by exactly similar legs. The highest skill of the artisan is required to meet and make allowances for all the little peculiarities of each individual wearer. It is ridiculous to assume that it is possible to fit all comers with artificial legs simply by carrying a few sizes in stock.

The worst mistake that the prospective purchaser of an artificial limb can make is to patronize one of the cheap establishments which are continually being started by disgruntled apprentices or discharged workmen. It seems incredible that a man who will not permit his horse to be shod by an incapable blacksmith, or his beard to be trimmed by a man of no experience as a barber, will nevertheless trust the delicate and vital task of supplying an artificial limb for himself or a member of his family to a crude bungler or a cheap mechanic. Yet such cases come to notice frequently. Too late, when permanent injury has been done to some delicate blood vessel or tender nerve center, or when a bad fall and broken bones have taught the lesson that better counsel might have imparted in the beginning, he turns to the firm that has a long-established reputation for efficiency, reliability, and honest dealing.

How much better—yes, how much cheaper—it would be to intrust one's self in the beginning to a firm the members of which have gained a thorough knowledge of the subject through a business experience of years, which spares no expense to secure the most perfect materials for its artificial limbs, which employs the most carefully trained and thorough workmen, which owns the most important and successful patents for artificial limb appliances, and the name of which is a guarantee of good faith, good workmanship, and satisfaction to its customers!

CHAPTER XXXV

DO THE MAIMED DIE YOUNG?

A False Belief.—There appears to be a belief, shared by the medical profession as well as the laity, that the amputation of one or more of the limbs from the human body necessarily curtails the allotted years of man, that there is a law that establishes a ratio between the length of the life of the normally equipped man and that of the dismembered one. That the ratio is according to the extent of the dismemberment. If a man is born to live three score and ten years, provided he retains all his limbs, the loss of one limb will take, say, ten years from that allotment; and if he loses two limbs the lopping off of a few more years will be the consequence.

What Our Records Disclose.—During our career as prothetic-ians we have had opportunities to investigate. An examination of our records, which comprise the histories of many thousands of maimed persons, has led us to the conclusion that the dismembering of the human body plays no part whatever in shortening life. Our records date back to 1853, and it is a fact that, of the entire number of our patrons, less than twenty-five per cent. have died, and most of those have died from old age or accident, and in no case can we learn of a death that can be directly ascribed to the loss of a limb. We know of very few persons wearing artificial limbs who have suffered or died from pulmonary or cardiac diseases, and those who have fallen under those diseases were affected before their limbs were amputated. It is not an uncommon occurrence for octogenarians who have been our patrons for years to order new limbs, expecting to live long enough to wear them out.

Amputations Revitalize the System.—As we investigate this subject more thoroughly we are persuaded that amputations revitalize the entire person, and render it not only possible but probable, that, on account of amputations, the lives of the subjects will be prolonged, comparatively immune to disease.

It is obvious that diseased and mangled limbs that cannot be cured will cause death if they are not removed; but this is not the phase of the question we are discussing. Will the length of life of the person who has had his limb removed on account of disease or injury be less than it would had his limb never been diseased, injured, and amputated? While it is absolutely impossible to give a direct reply to this question we believe, and we say it with all sincerity, that the compensation for the loss of a limb lies in assured good health and prolonged life. Numerous instances support this belief and many of them are of national reputation.

Illustrations.—Rev. Edward Beecher reached the age of eighty-four. Evidences of senility were apparent. By making a false step he fell from a railroad train and had one of his legs so badly crushed that it had to be amputated. He recovered from the operation and had an artificial leg applied. He lived for eight years and enjoyed excellent health and remarkable physical strength and mental energy. It was his custom to take long walks every day, to preach sermons on Sundays, lead prayer meeting during the week, and in fact, perform all the duties expected of a clergyman. From the moment he recovered from the accident that deprived him of his leg, new life and renewed energy came to him. He was a stronger, healthier, and more sprightly man after the accident than he had been for a number of years prior to it.

Governor Wade Hampton lived to be an octogenarian. He had a leg amputated a number of years before and wore an artificial one up to the time of his death. He was up to the last moment mentally and physically strong.

John Pearson lived to be eighty-five years of age. He lost a leg when seventy, recovered quickly, obtained an artificial leg, enjoyed vigorous health, giving his time to his railroad interests almost up to the moment of his death. General Butler, General Wager Swayne, and scores of others have more than fulfilled the biblical allotment and enjoyed many years of active life after having been deprived of one of their limbs.

It is a remarkable fact that there are very few maimed persons in insane asylums. Records of suicides are almost free of the crippled. The mental as well as the vital forces appear to become stimulated by the dismemberment.

Athletes.—Dare, Melrose, Conway, Leland, and Fitzpatrick are one-legged acrobats whose muscular developments are the envy of the world. Few possessed of natural limbs can vie with them in athletic activities.

It is a noticeable fact that persons who lose their legs become powerful in their arms, large in chest and girth, and persons who lose their arms become powerful in their legs and large in girth. The loss of one part of the body stimulates the growth of the remaining parts.

Compensation.—A reasonable explanation may be found in the hypothesis that the removal of a part of the body lessens the demand on the vital forces and permits the supplying reservoirs to contribute more abundantly to the remaining members. If it overtaxes the heart to force the blood through all the avenues of the body, will not its labors be lessened if some are cut off? And will not the remaining avenues receive a larger share of the life-giving essences? If the nervous system is taxed to its limit, will not the tax be lessened if a part of the nerve organization be removed? If a tree is permitted to grow unpruned, it will sap itself by many choking branches and the trimming up of the limbs always gives vigor. The tree will grow larger, stronger, and will live longer.

It has been said that a maimed person takes care of himself, does not expose himself to the elements, or to the dangers that beset other human beings; that on account of being crippled, he is compelled to be more cautious than others; he cannot indulge in the riotous, inebriate course which wrecks so many lives. In this connection we will say, and we speak from knowledge, that a person who is deprived of one or more of his limbs is not necessarily a convert to a life of virtue. He is not always the sober man, the epitome of morality that some persons think he is. He goes through life in the same careless manner as other healthy mortals, doing what he ought to do, and many times what he ought not to do. He sometimes observes propriety, but oftentimes is as reckless as his companions. There are, however, many maimed persons who are sober, industrious, thoughtful, and prudent. The same habits, indulgences, and discretions that are found among those in possession of their natural limbs are found in about the same proportion among those who have been amputated.

Gratitude.—It is also an error to suppose that the loss of a limb induces despondency. There will not be found a class of people who are less lugubrious and who lament their losses as little as that class of humanity having abbreviated extremities. We recall the visit of a man some years ago who had both of his legs and one arm amputated. After reciting a harrowing tale of a railroad collision and fire, weeks of suffering at the hospital, and his recovery to health with only one of his four limbs remaining, he closed his narrative with the ejaculation: "Thank God, it was no worse!" This illustrates fairly well a crippled man's disposition. He is more thankful that he has not lost more, than he is regretful for having lost so much. He is constantly meeting with persons who, in his mind, have met with greater hardships than himself. It is an ordinary occurrence for a one-legged man to meet a one-armed man, and for each to say to the other, "I prefer to be as I am rather than as you are."

A cripple is neither a cynic nor a pessimist. His misfortunes have driven from him whatever there may have been of the choleric. Being always in good health, he is a happier and a more contented man than the dyspeptic, the rheumatic, or the gouty man, who is in possession of all his limbs. It is a common occurrence for a man wearing two rubber feet to take consolation from the fact that he can never be troubled with corns, gout, or suffer the torture of having some ponderous lout tread on his feet.

Nature, with her usual generosity, compensates for every misfortune. We look about us and see conditions that are appalling, and are impelled to pour out our commiseration; but we little think how useless, how unsolicited, and often uncharitable it is for us to do so. Those that are the most afflicted need our commiseration the least. Their minds and dispositions have already been prepared by Nature to bear their misfortunes, and they dislike to have others notice or mention them, much less to shed tears over that which they so little regret themselves.

CHAPTER XXXVI

AWARDS

1858. The first Exposition at which A. A. Marks exhibited artificial limbs was at the Crystal Palace at New York in 1858. As that exhibition was destroyed by fire no awards were given.

1859. American Institute, New York City.—The silver medal was awarded to A. A. Marks for his superior artificial limbs.

1865. American Institute, New York.—After a careful and extended examination, and practical tests of the various kinds of artificial limbs, the First Premium Gold Medal was awarded to A. A. Marks.

1867. American Institute, New York, First Premium.—Marks' Patent Artificial Limbs have frequently been before the Institute and continue to sustain their former reputation. The First Premium awarded.

1869. American Institute, New York.—A. A. Marks Best. This limb is constructed with an india-rubber foot, which from its elasticity does away with the necessity of motion at the ankle, and also obviates entirely that heavy, thumping sound when the foot strikes the ground in walking. The control which the wearer has over it and its movements, so closely resembling those of the natural limb, entitles it to the highest commendation. First Premium awarded.

1870. American Institute, New York.—The especial point of excellence appears to be the rubber foot, by the use of which all complications in the construction of an ankle joint are avoided. First Premium awarded.

1871. American Institute, New York.—The artificial limbs with rubber feet and rubber hands are especially recommended for their simplicity, durability, and easy movements. First Premium awarded.

1872. American Institute, New York.—The artificial limbs manufactured by A. A. Marks continue to merit approval, and are entitled to all the confidence the public have reposed in them. First Premium awarded.

1873. American Institute, New York.—After full and impartial examination of the articles above described, the undersigned Judges make report that they find the artificial limbs on exhibition by A. A. Marks worthy of the confidence heretofore reposed in them. We cheerfully indorse all that has been said of them by former examiners, *their simple construction, easy movements, durability, etc.* First Premium awarded.

1874. American Institute, New York.—We consider the artificial limbs of A. A. Marks of great value. A great improvement

—better than any known to us; and entitled to the highest award. First Premium awarded.

1875. American Institute, New York.—We regard the artificial limbs presented by Mr. Marks superior to all others in practical efficiency and simplicity. First Premium awarded.

1876. Centennial Exhibition, Philadelphia, Pa.—The Judges having examined Marks' artificial limbs respectfully recommend the same to the United States Centennial Commission for the highest award, for the following reasons, viz: Utility, Workmanship, and Adaptation to Purposes Intended. Highest award given.

1876. American Institute, New York.—The judges consider the limbs made by A. A. Marks remarkable for simplicity of construction, durability, efficiency, and comfort to the wearers. Special Gold Medal awarded.

1877. American Institute, New York.—After a full and impartial examination of Marks' artificial limbs, the Judges report that they consider the exhibit of great value and entitled to highest award. Medal for Superiority awarded.

1878. American Institute, New York.—Having received the Medal of Superiority in 1877, The Diploma for Maintained Superiority is awarded at the Exhibition of 1878.

1881. International Cotton Exposition, Atlanta, Ga.—First Premium, Gold Medal, awarded for the following reasons:

First. Simplicity in the mechanism of the knee joint and its excellent movement. Second. Durability. Third. Rubber Foot, possessing many excellent qualities and compensating for the absence of the motion in the ankle joint. The highest award was declared in favor of A. A. Marks.

1885. The World's Industrial and Cotton Centennial Exhibition, New Orleans, La.—The Jurors having carefully examined the exhibits of artificial limbs concur in recommending the award of the First Class Medal to A. A. Marks, New York. Gold Medal awarded.

1889. The John Scott Legacy Premium and Medal.—John Scott, late of Edinburgh, by his will made in the year 1816, bequeathed a sum of money to the Corporation of the City of Philadelphia, directing that the interest and dividends received therefrom shall be laid out in premiums, to be distributed among ingenious men and women who make useful inventions, and that therewith shall be given a medal with this inscription:

"To The Most Deserving."

The great improvements in artificial limb construction consist in the substitution of rubber for wood in both the foot and hand.

The rubber foot consists of a wooden block rigidly secured or formed with the leg and extending downwardly to within about two-fifths of the distance from the ankle to the sole, and forward to nearly the first articulation of the metatarsus and toes; this block is covered with india-rubber.

The action of such an artificial foot is that of an elastic segment

of a wheel. The shock of placing the weight upon the heel at each step is avoided by the elastic cushion of rubber forming the heel, and as the weight is progressively transmitted to the forward part of the foot, by the combined effect of muscular exertion in the remaining part of the natural limb, and the momentum previously acquired, an easy flexure of the toes takes place, which, reacting elastically as the weight is transferred to the other limb, giving an easy and naturally appearing movement. Such artificial feet are, upon trial, found to be easier to use, lighter, and more comfortable.

The desire to adapt the india-rubber hands to changes of flexure, for purposes of better and more natural appearance and to grasp light objects, led Mr. Marks to improve them by making a light wooden core in the palm or metacarpal portion of the hand and inserting ductile metallic wires in such core, which extended centrally through the fingers. By bending the fingers they retain the form in which they are set.

The latest improvement in artificial limbs consists in forming the leg and foot part of a single piece of wood, having the grain curved naturally in its growth, such pieces being procured from the parts of the trunk contiguous to the roots and branches of trees; limbs made in this way are stronger with the same amount of wood remaining in them than when made of parts glued together, and are made waterproof, which is a valuable feature when the occupation of the wearer exposes it to constant dampness, or to water itself, as in fishing, mining, dredging, etc.

The above report was presented to the committee appointed by the City of Philadelphia, under the auspices of the Franklin Institute, and it was unanimously decided that the John Scott Legacy Medal and Premium be awarded to A. A. Marks.

1891. Augusta Exposition, Augusta, Ga.—Seven Gold Medals and Awards for distinct and separate features of excellence.

First. For Improved Artificial Legs with Rubber Feet.

Second. For Improved Artificial Arms with Rubber Hands.

Third. For Superior Methods of Suspenders for Artificial Legs and Arms.

Fourth. For Superior Crutches and other Auxiliaries for Cripples.

Fifth. For a Combined Knife and Fork for the use of one-armed men.

Sixth. For Improved Waterproof Artificial Legs, carved from natural crook timber.

Seventh. For Improved Artificial Legs and Arms with Aluminum Sockets.

1893. The Elliott Cressons Gold Medal, awarded to A. A. Marks for aluminum socket artificial legs and arms, as stated in the following report:

At the stated meeting of the committee on Science and the Arts of the Franklin Institute, held February 1, 1893, the following report was adopted and ordered to be issued:

This invention consists of an improved method of making arti-

ficial limbs, adapted to amputations in the ankle, or below, in the tarsus or metatarsus, in which the former modes of construction, with articulated ankle joints of wood as the material, were impracticable and unsatisfactory. The new method of construction involves the use of aluminum as the material to form the shell socket or sustaining frame, as it might be called, the aluminum shell supporting the body, and forming the attachment for the elastic rubber foot, which acts as a rolling elastic segment simulating the functions of the natural foot in walking, and acting as an elastic cushion in relieving the wearer from the jar or shock of resting the weight upon the limb.

Your committee has examined the limbs in the course of manufacture, and as completed and as in use by wearers. When clothed, they give no indication in walking that they are not natural feet.

It is clearly apparent that the invention is one affording much-needed relief to persons heretofore greatly embarrassed, and further that the surgeons may save much more of the patient's body from mutilation than heretofore, and yet render comfortable and satisfactory artificial limbs practicable.

In view of these points of excellence and well-attested evidence thereof the committee awards the Elliott Cresson Medal to Mr. Marks, of New York.

1893. World's Columbian Exposition, Chicago.—The judges appointed to investigate artificial limbs decided in favor of Marks' artificial limbs and recommended to highest award on the following points of excellence.

First. Rubber Foot. (*a*) Its close approximation to the motions and actions of the natural foot.

(*b*) Its durability and lightness; the yielding and elastic qualities of rubber supply requisite motion without necessitating mechanism.

(*c*) Phalangeal assistance. The methods of construction and connection with the body of the leg in each case are such as to provide assistance in walking from the anterior portion of the foot, at the same time maintaining the height of the wearer when walking, same as is obtained from the natural foot; the feature of phalangeal assistance avoids limping, and removes the fear of toppling forward when standing.

(*d*) The elasticity of rubber affords a yielding medium to alight upon, thus avoiding jars and concussions to the stumps.

Second.—Knee Joints. (*a*) The construction of knee joints is such as to render them capable of adjustment, thus obviating the noise that follows attrition.

(*b*) The disposition of the knee spring, which assists extension of the lower leg, is such as to become neutralized when the leg is flexed to a given angle; this avoids "kicking out" of the lower leg when the wearer is sitting and unguarded.

(*c*) Safety lock. This attachment is combined with the knee mechanism, and provides against treacherous flexing of the knee, thus avoiding dangerous falls.

Third. The production of waterproof legs from natural crook timber with rubber feet attached.

Fourth. Aluminum sockets, especially designed for stumps that extend to the ankle and in the body of foot.

The advantages obtained by the utilization of this metal are as follows:

(*a*) The production of a socket that can be closely fitted to the stump, without touching or allowing painful contact with any of the tender spots on the stump, at the same time possessing sufficient strength to properly support the wearer.

(*b*) The construction of a socket that will possess the requisite strength without conspicuously enlarging the ankle.

Fifth. Roller Suspenders. The object of this method of suspending an artificial leg to the wearer is to avoid the moving and rubbing of the shoulder straps on the shoulders.

First. The Rubber Hand. (*a*) Being composed of rubber, is pleasant and natural to the touch and durable in construction.

(*b*) The fingers, being ductile, can be placed into accommodating positions.

(*c*) The palm of the hand, being provided with a locking socket, is capable of holding implements of utility with firmness.

Second. The ability to detach the hand at the wrist for laboring purposes.

Third. Rotation of hand at wrist.

Fourth. The elbow joint, with lock for holding the arm in a flexed position.

Fifth. Fingers and parts of hands made of rubber.

Sixth. Rotation of upper arm socket.

In conformity with the Judges' report, the highest award (medal and diploma) was declared in favor of A. A. Marks, New York City.

Two additional diplomas were awarded by the Board of Lady Managers, one for Design, and the other for Invention.

1895. Cotton States and International Exposition, Atlanta, Ga.—This certifies that the appropriate jury has awarded to A. A. Marks of New York City the Gold Medal "For the most complete exhibition of ingenious mechanics for the relief of physical defects and deformities, namely: Artificial Legs, Rubber Feet, Artificial Knee Joints, Self-Adjusting Suspenders, Artificial Arms, Rubber Hands, Duplex Elbow Joints, and Aluminum Socket Legs; also for Imitating the Movements of Knee, Elbow, Wrist, and Finger Joints."

1896. American Institute, New York.—After a full and impartial examination the Judges made report:

That the exhibit of A. A. Marks of artificial limbs, deserves the highest award for the following reasons.

First. To the rubber foot with imbedded metallic mattress spring.

Second. To the flexible fingers on artificial hand, and their great adaptability to everyday use.

Third. The use of aluminum in place of wood for climatic varia-

tions seems to be of practical use for those engaged in certain employments.

Finally, the ingenious combination Knife and Fork for the one-armed is highly commended. The medal of superiority was accordingly awarded.

1897. Tennessee Centennial and International Exposition, Nashville, Tenn.

The highest and only award for artificial limbs was given to A. A. Marks of New York.

The merits that received especial recognition were: Artificial Legs with Rubber Feet, Adjustable Knee Joints, Artificial Arms with Rubber Hands, and a Combination Knife and Fork for one-armed persons.

1898. Trans-Mississippi and International Exposition, Omaha, Neb. Diploma and Gold Medal awarded to A. A. Marks, New York.

Marks' Artificial Legs with Rubber Feet and Artificial Arms with Rubber Hands are superior to all others in the following points:

Excellence of mechanical construction.
Minimum weight, maximum durability.
Noiselessness.
Motions that simulate nature.
Knee joints, adjustable and noiseless.
Suspenders, of variety adaptable to every condition.
Knee lock for short and enervated stumps.

Fittings that permit pressure at points of toleration, avoiding impact on the vascular parts, thereby preventing choking of blood vessels.

Rubber hands with ductile fingers, most accommodating and possessing the greatest range of utility.

1900. Exposition Universelle de Paris, France.

A. A. Marks, New York.

Dear Sir:—I am instructed by Commissioner General Peck to inform you that you have been awarded the

(GRAND PRIX) Grand Prize

for your exhibit in Class 16 at the International Exposition, Paris, 1900.

Respectfully yours,

J. H. Gore, Juror-in-Chief.

In competition with nearly fifty manufacturers from all parts of the world, A. A. Marks won over 20 POINTS OF MERIT, thereby earning the ONLY GRAND PRIZE FOR ARTIFICIAL LIMBS.

1901. Pan-American Exposition, Buffalo, N. Y. The points of merit and claims for superiority presented to the Board of Jurors, as follows:

First. The rubber foot with spring mattress.

Second. Knee joint with adjustable bearings and removable bushings.

Third. Hip joint for hip-joint amputations.

Fourth. Knee lock for short and enervated stumps.

Fifth. Suspenders arranged to minimize the burden and tax on the shoulders.

Sixth. Aluminum sockets for ankle-joint and partial foot amputations.

Seventh. Rubber hand with ductile fingers and palm attachment for holding implements.

Eighth. Wrist joint admitting of rotation, displacement of the hand and substitution of laboring implements.

Ninth. Elbow lock, holding arm in flexed and other positions.

Tenth. Humeral rotation, admitting the arm to rotate above the elbow joint, so that when flexed it can be brought closer to the person.

Eleventh. Artificial hand for partial hand amputation.

Twelfth. Artificial legs for bathing purposes that are absolutely waterproof.

Thirteenth. Artificial arms that are absolutely waterproof.

Fourteenth. Combination knife and fork designed for persons who are temporarily or permanently disabled in one hand.

Upon these points of merit the Gold Medal and Diploma were awarded to A. A. Marks.

1902. South Carolina Inter-State and West Indian Exposition, Charleston, S. C. Gold Medal awarded to A. A. Marks, of New York, for artificial legs and arms of superior construction.

1904. The Louisiana Purchase Exposition (World's Fair), St. Louis, awarded to A. A. Marks, of New York, the only GRAND PRIZE for ARTIFICIAL LIMBS, the highest award given to any exhibit in any department.

The Grand Prize at St. Louis following the Grand Prix at Paris. 1900, prove beyond controversy the superiority of Marks' artificial legs, feet, arms, and hands, and the maintenance of their excellence not only in America, but throughout the entire world.

1905. The Lewis and Clark Centennial Exposition, Portland, Oregon, awarded two Gold Medals (highest awards) to A. A. Marks, New York, manufacturers of the celebrated artificial limbs with rubber feet and hands.

1907. New Zealand International Exhibition, Christchurch, New Zealand, November, 1906, to April, 1907. The highest award of merit, Gold Medal, to A. A. Marks, New York, U. S. A., Artificial Limbs.

FOREIGN MONEY EQUIVALENTS.

The prices given in this book are in United States money. Parties ordering artificial limbs or supplies can make remittances in their own national money or any money that may be most available. The following table has been computed according to the rates of exchange August 1st, 1905.

UNITED STATES.		BRITISH.			FRENCH.		GERMAN.		MEXICAN.	
Dollars.	*Cents.*	*Pounds.*	*Shillings.*	*Pence.*	*Francs.*	*Centimes.*	*Marks.*	*Pfennigs.*	*Pesos.*	*Centavos.*
100	00	20	11	6	518	15	420	20	220	00
75	00	15	8	7½	388	62	315	15	165	00
65	00	13	7	6	336	81	273	13	143	00
60	00	12	6	11	310	89	252	12	132	00
50	00	10	5	9	259	08	210	10	110	00
40	00	8	4	7½	207	26	168	08	88	00
35	00	7	4	0½	181	36	147	07	77	00
30	00	6	3	5½	155	46	126	06	66	00
25	00	5	2	10½	129	54	105	05	55	00
20	00	4	2	4	103	63	84	04	44	00
15	00	3	1	9	77	73	63	03	33	00
10	00	2	1	2	51	82	42	02	22	00
5	00	1	0	7	25	91	21	01	11	00
2	00		8	4	10	36	8	48	4	40
1	00		4	2	5	18	4	24	2	20
	50		2	1	2	59	2	12	1	10
	25		1	0½	1	30	1	06		55
	10			5		52		42		22
	5			2½		26		21		11

CHAPTER XXXVII

TESTIMONIALS

This chapter contains about eight hundred testimonials, all received during the few months in which the book was being compiled.

It has been necessary to cut out all irrelevant matter in order to give each writer his share of the space allotted to the chapter.

Most of the letters, as will be seen, were written by persons of wide experience; those who have worn artificial limbs of a variety of manufacturers. These we consider the most competent to judge.

Nearly every kind of leg amputation, as well as deformity, is shown; nearly every industry, and practically every part of the world, represented.

It will be noticed that most of the writers were supplied without leaving their homes. They had their measurements taken, and sent to us, and had artificial limbs constructed by them. Chapters XV to XXX enlarge on this feature.

*ALL TESTIMONIALS MARKED WITH AN ASTERISK (*) ARE FROM PERSONS WHO WERE FITTED FROM MEASUREMENTS.

It was customary in former times to give with each testimonial the full post-office address of the writer; but the frequency of complaints by the writers as well as the readers, has induced us to locate by counties and states only and furnish complete addresses when asked for. Artificial limb wearers move about the same as other persons. Among eight hundred, a large proportion change their locations every year and cannot be reached by the old addresses. For this reason it is better to give up-to-date addresses as they are needed and called for. Any person desirous of communicating or conferring with testimonial writers can make a list from this chapter and send it to us. Immediately upon its receipt we will send addresses that have been corrected to date.

* FRANK ADAMS—Farmer, Amherst Co., Va. Below elbow.

About two years ago I got an artificial arm from you as I had lost my right arm just below the elbow, leaving a very short stump. I use your arm in the most advantageous way. I have to do all kinds of farm work. I would not be without it for double the money I paid for it. May 9, 1904.

* GEO. ABBOTT—Accountant, Newfoundland. Below knee.

Am pleased with my foot. I know it will last a long while yet. It was made from measurements taken at home and sent to you.

* ANTONIO ALARCON—Mexico. Below knee.

When I gave my order I never imagined that an artificial leg could form so perfect a substitute for the natural one in walking, riding on horseback, and even dancing; I supposed it would merely serve to hide the defect. Experience has demonstrated to me the superiority of the artificial legs with the rubber foot. They combine simplicity of construction with stability and ease in walking. —Translated from Spanish.

* WM. E. ALBEE—Stoker, Franklin Co., Mass. Below knee.

I have used the leg you made for me about eighteen months. My work is firing stationary boilers; it is hot and heavy. I believe

that I could not have done the work that I had to do last winter with any other artificial leg I ever had. June 11, 1904.

* MRS. IDA ALBURY—Housewife, Bahamas, W. I. Below knee.
Last September I had an artificial limb made by you and it fitted well. I have a family of six and I do all the work myself, I don't know any woman in the town that can do harder work than I. May 25, 1904.

* D. A. ALLEN—Station Agent, Franklin Co., Ark. Knee amputat'n.
The four artificial legs furnished by you at different times have given entire satisfaction in every respect and have all been perfect, although made from measurements taken by myself. I am employed as agent and operator for I. M. & S. R'y. and attend to all the various duties connected with the position. May 30, 1904.

* FELICANO ALMANZA—Ranchman, Union Co., N. M. Below knee.
In regard to my artificial leg, I am getting along nearly as good as if I had my own leg and not an artificial one. I work at any kind of work and ride a horse, for which I am proud and thank you for the handling.—Translated from Spanish. May 14, 1904.

* MRS. E. E. ABEL—Housewife, Ontario. Knee amputation.
I am very thankful for the leg made me from measurements last

October. I do all my housework and a lot of walking and I have never used a cane or anything, and I can walk without any trouble. April 25, 1904.

LEONARD D. ALPAUGH—Brakeman, Morris Co., N. J. Below knee.
On July 29th last I lost my left leg three inches below the knee, and soon after purchased an artificial one from you, which has given me entire satisfaction. The leg is a good strong one, and can be depended upon in performing all the work I have occasion to put upon it. May 11, 1904.

* CHAS. C. ANDERS—Brakeman, Northampton Co., Pa. Below knee.
I am wearing the leg you made me since the day I got it, without having it off except to sleep; I have walked as far as twelve miles in one day. I work hard with the leg, and my stump is always well. May 5, 1904.

* EDW. ANDERSON—Student, Douglas Co., Wis. Below knee.
Having walked on crutches for a period of seven years, I at last decided to have my leg amputated, three inches below the knee. As soon as I was able to get around I interviewed several artificial limb makers, with little encouragement. Having heard of your remarkable successes, and following the advice of our leading doctor, I ordered of you. I have worn the leg for two years with no grounds for complaint. I am a student, on my feet most of the day. I ride a bicycle as well as anyone. May 6, 1904.

* JOHN ANDERSON—Lamp-lighter, Bibb Co., Ga. Above knee.
The artificial limb you made for me in June, 1902, has been in use ever since. I am well pleased with it, and am able to go about as well as ever. May 17, 1904.

THOMAS APPLEBY—Farmer, Ontario. Below knee.
It is with pleasure I inform you that the artificial leg you made for me, nearly a year ago, is being used satisfactorily and advantageously. I cannot give too much praise for your work, and doubt very much that the limb can be improved upon. I wear it constantly without the least discomfort. April 27, 1904.

W. L. APPLEY, M. D.—Sullivan Co., N. Y. Below knee.
I have worn Marks' patent leg for years. I am well pleased with it. It has not required the least repairs. I can walk better with it than any other leg I ever used except the natural one. I consider Marks' India-rubber foot a valuable improvement to Artificial Legs.

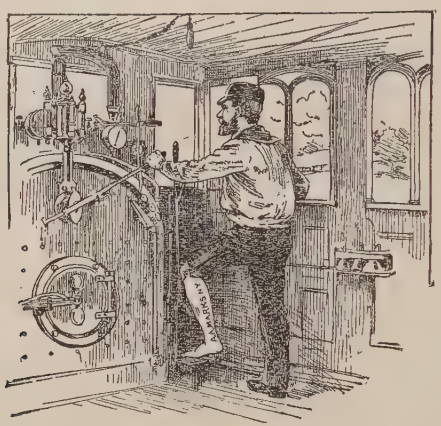
MISS JOSEPHINE AREY—Penobscot Co., Me. Shortened leg.
I wish to express my continued gratitude for the apparatus made by you five months ago. At that time I could not get about the house without the assistance of a crutch. I walk now without the assistance of a cane. It seems as though I were living in a new world. It has done more for me than I ever dared hope for. I only wish all who are thus afflicted might be able to call on A. A. Marks, who will add much happiness to their lives and benefit them as much as he has me. May 5, 1904.

LAUDELINO ARIAS—Teacher, Cuba. Leg paralyzed and short'n'd.
It is now a year since I began to use the apparatus which you constructed in New York, and I am well satisfied with it. Ever since the first day I put it on I abandoned the crutches, and shortly afterwards the cane which I had been using for thirty years. I am at present walking without any fatigue, although I walk a great deal. Your product is so perfect it conceals my deformity. Thanks to the apparatus I am able to continue in the discharge of the duties of a professor of public school, as the laws of Cuba do not allow those persons who have to use crutches or canes as a means of locomotion, to be licensed as public-school teachers. I am so grateful for the good you have done me that I have recommended your house to all those in this locality who may require apparatus, or artificial legs and arms.—Translated from Spanish. April 24, 1904.

A. J. ARMSTRONG—Train Dispatcher, Erie Co., N. Y. Below knee.
In 1891 I suffered the amputation of my right leg. After trying two different makes—one with cords and ankle joint and the other with hard rubber—I purchased one of your legs with sponge rubber foot in 1895. I wore it until last November with perfect

satisfaction, and without one cent cost for repairs. In my occupation as train dispatcher for the New York Central R. R., I do not have to be on my feet as much as others, but my home is two miles from the office, and I walk both ways in winter and ride my wheel in summer. In fact I do the same as I would if I were on my own foot. The one I purchased from you last fall gives the same perfect satisfaction. I think eight years of constant wear without a cent for repairs, must appeal with force to wearers of artificial feet with cords and ankle joints. May 6, 1904.

* WILLIAM J. ANGIER—Engineer, Wake Co., N. C. Below knee.
I have no trouble with my artificial limb. It is the third of your legs that I have worn, and I am proud to say that I would



not have any other. My amputation is six inches above the ankle, left foot. I am running a locomotive every day, hauling passenger trains, and I am never inconvenienced in any way. May 9, 1904.

* MRS. J. W. ARMSTRONG—Bexar Co., Tex., son Freddie, aged 9.
I cannot estimate the comfort my little son has in the limb you made for him seven years ago, when he was only two years old. It enables him to take part in all boyish pastimes, and he goes from morning until night, running, walking, and playing the same as other boys, and without fatigue. June 28, 1904.

* S. C. ARNUP—Ontario. Wrist joint amputation.
I use the artificial hand which you made for me, for writing, which I am at present doing quite a bit of. I find it fully as satisfactory as could be expected. April 19, 1904.

* SYLVESTER R. ASH—Clerk, Philadelphia, Pa. Below elbow.
I have been using one of your arms for nearly two years, and would not be without it. I am a clerk in a large store and can do a great deal more work than I could without it. May 9, 1904.

* TIMOTHY ARSENAULT—Farmer, Bristol Co., Mass.
My new artificial foot fits all right. I find it even better than the other one. I find it a necessity, for without it I don't know what I should do. May 5, 1904.

* JOSE A. ARRIGHI—Arg. Rep. Above knee.
I have the pleasure to inform you that the leg procured for me by Mr. Jose Anto. Orfila, over two years ago, has proved excel-

lent, and the fit is perfect, even in the heat of this season of the year, and when the weather is temperate, I cannot tell that I am wearing it. I walk three miles a day, sometimes much more, with the greatest ease and comfort.—Translated from Spanish.

* JUDGE ASHFORD—Drayman, Lauderdale Co., Miss. Above knee.
I lost my leg on the railroad, very close to my body. Twenty-one months after I purchased an artificial leg from A. A. Marks and I commenced wearing it. It is all right, I have no trouble with it at all. My occupation is a drayman in this city, and I get around all right and do my work well. May 8, 1904.

* IRA E. ATKINSON, M. D.—Dodge Co., Neb.
The artificial leg procured from you in 1893, for Antone Pojar, has given entire satisfaction.

* A. J. AUSTIN, M. D.—Mexico.
Mr. Andres Cantu, for whom you made an artificial leg some time ago under my order, desires me to inform you that he is well pleased with it. His business requires him to travel horseback at any time, day or night. He walks well without a cane, all of which is really remarkable, owing to the shortness of the stump, which is 2½ inches from the body.

* H. E. AUSTIN—R. R. Clerk, Dupage Co., Ill. Above knee.
About a year ago I received from you the fourth one of your make of artificial legs that I had worn in the past forty years. My amputation is above the knee. All of my legs have been made from self-measurements, and every one has been an improvement on the previous one. I walked a young man half my age and weight (I am 52 years, weigh 240 pounds) to a standstill both in speed and distance. May 17, 1904.

* WALTER P. BAGLEY—Lumber, New Brunswick. Below elbow.
Two years ago I had the misfortune to have my left hand and part of my arm so badly mashed that amputation became necessary, four inches below the elbow. Three days after my friend, Mr. Cote Shields, who met with a like misfortune himself, and who is wearing one of your artificial hands with perfect satisfaction, came to see me, and in the course of conversation he asked me if I intended to get an artificial hand. I acknowledged my intention to do so just as soon as my stump was healed, and as a matter of course he advised me to place my order with you, stating that it was impossible for me to get an artificial limb to compare with A. A. Marks' in construction and durability. His statements were so convincing that four weeks later I sent to you for an arm. Two weeks after I received it. It was a perfect fit, and has been very satisfactory in every respect. I have worn it now for two years, and I consider it would be simply impossible for me to accomplish the work in my profession without its aid. My vocation is at present lumber surveying. April 20, 1904.

COL. JONATHAN BAKER—Elizabeth Co., Va. Below knee.
I am living at the National Soldiers' Home in Virginia. My leg was amputated below the knee fifteen years ago. Since that time my experience with the Marks' manufactured legs is entirely satisfactory. I can walk eight miles a day with ease and do laboring work. May 18, 1904.

* NORMAN COLE-BAKER—New Zealand. Above knee.
I have worn one of your legs since 1889, and have hardly had it off in all that time for a single day, and the last four years I have been living back in a new settlement where everything is very rough. I have often been fourteen hours on horseback at a time, either stock riding or packing, and during the winter do my share of bush felling. The rubber foot acts splendidly.

* LUTHER BARBER—Laborer, Beaufort Co., N. C. Below knee.
I am getting along well with the artificial limb you furnished me. I am highly pleased with it, it is not giving me any trouble. I recommend your limb to anyone in need. May 11, 1904.

* ALFREDA BARRETT—Seamstress, Newfoundland. Above knee.
I wouldn't part with my artificial leg for thousands of dollars if I could not get another. The leg is a perfect fit, and I have never had any trouble. April 23, 1904.

J. F. BALDRIDGE—Carpenter, Wyandotte Co., Kan. Above knee.
I still wear the leg you made me years ago. I am able to walk much better than before amputation. Having been a cripple since

the Civil War. I have built a house each year, two of which were two stories high, doing most of the work myself on every part of the building, and without the suffering I endured before amputation. May 2, 1904.

GEO. HY. BARSTOW—Salesman, England. Above knee.
Years ago you supplied me with one of your legs with rubber foot. The leg has been to me everything that you represented, and even more, and I could not say too much in its favor; sometimes I almost forget my loss, and that is saying a great deal. Being a commercial traveler, I am constantly on my feet. I cover the whole of Great Britain, with an occasional visit to Holland and Belgium.

A. E. BARTRAM—Fairfield Co., Conn. Below knee.
I have been wearing your patent artificial leg for the past thirty-four years; I had previously worn others, but they were not satisfactory. In my opinion, your leg is far superior to any other artificial leg made, because of its simplicity, elasticity of the foot, and its noiselessness; these are obtained by the use of the rubber foot, and I think it is the only sensible thing. December 10, 1904.

* EDWARD BASSETT—Age 79, New Zealand. Knee amputation.

The artificial leg I got from you I am well pleased with. One of the doctors told me it was folly of me getting one, a man of my age. I was 76 when I got it. Now I can walk and do a lot of things about the house and yard, which keeps me in good health.

June 9, 1904.

* L. A. BASTIDAS—Rep. Colombia. Below knee.

My right leg was amputated a little below the knee in 1887. As soon as the stump was healed I was advised to order an artificial

leg from you. I received one in 1889. The leg fitted correctly, and I handled it with extreme facility. Although it was only guaranteed for five years, it lasted me until the end of 1902, and was then in good condition. I, however, replaced it with another from your establishment, and in it I noted important improvements. My occupation is that of a merchant and farmer. I take trips on horseback over very rough roads of 36 to 60 leagues. I walk with ease and comfort.—Translated from Spanish. July 10, 1904.

* JOSEPH H. BATY—Ship Caulker, Westchester Co., N. Y.

In 1865 I had the misfortune to lose my right foot and part of the left on the Harlem Railroad, and when it was healed I called on you to furnish me with a substitute for the lost member. I have been wearing one constantly for the last thirty-nine years, and can truthfully say that I am more than satisfied with it, not knowing what I would do without it, as my work is very heavy at times and keeps me either on my feet or moving about. My trade, as you know, is ship caulker. May 30, 1904.

* WALDEMAR H. BAUMEISTER—Printer, Warwick Co., Va.

The arm made for me two years ago is all right every way and thoroughly satisfactory. May 30, 1904.

* CHARLES H. BECKER—Farmer, Columbia Co. Below elbow.
I am wearing one of your artificial arms purchased about three years ago fitted from measurements, amputation below the elbow joint, it pleased me much better than I expected, it enables me to do all kinds of work on the farm. May 12, 1904.

* JUAN BECKER—Uruguay, S. A. Below knee.
I received the artificial leg with rubber foot which you made for me and I have been wearing it constantly ever since and can walk perfectly and do all kinds of work. I am compelled to be on foot, walking about from morning till night, and my stump never feels fatigued. I therefore tender you my most sincere thanks for sending me such a perfect apparatus.

W. C. BEDFORD, M. D.—Cochise Co., Ariz.
Marks' rubber hand has been especially satisfactory.

* ALBERT W. BEEBE—Molder, New London Co., Conn. Both legs.
I was hurt at Groton while trying to board a moving train. Had left leg taken off six inches below the knee and the right at the instep. I am now wearing your legs, right foot on one side, and a full leg on the other. Can go upstairs and walk long distances. I am a molder by occupation. May 5, 1904.

* J. ARTHUR BEGIN—Quebec. Below elbow.
In June, 1898, I bought of you an artificial hand for amputation at the wrist joint. I have worn it constantly since that time, never took it off but for changing my underwear. Many times people who did not meet me for a little while have said to me, "I thought I heard about you having lost one hand." August 8, 1904.

* THOMAS BELDEN—Watchman, Coffee Co., Ga. Below knee.
I take pleasure in assuring you that the artificial leg I lately purchased of you is affording me entire comfort, it almost takes the place of Nature's leg in my present employment. I am night watchman and sweeper at the mill and am constantly on my feet and in a position to judge.

* FRANK D. BELL—New Zealand. Above knee.
You may be pleased to hear that Mr. Trapski is successfully using the leg you made for him and can walk easily and quickly. He has every reason to be grateful to you, and will, I am sure, readily recommend your firm to anyone suffering from a like misfortune. In this recommendation I gladly join.

J. FINLEY BELL, M. D.—Bergen Co., N. J.
I ordered a Marks artificial hand and arm for a patient, and it has given good satisfaction.

CHARLES BENTLEY—Weigher, Lawrence Co., S. D. Below elbow.
I have been wearing an arm of your make for about a year and have found it very satisfactory. I am working in an assay office and could not hold my present position without it. May 5, 1904.

* V. BERNIER—Laborer, Quebec. Shoulder.
I feel quite satisfied with my new arm and everything goes all right. May 5, 1904.

MONS. F. J. BERNIER—Montreal. Below knee.

It affords me great pleasure to add my testimonial to the long list you already have. I am a professional prestidigitateur. When I lost my leg, I realized the importance of getting an artificial one that would imitate nature in shape and action as well as possible. I traveled a great deal and examined the works of most of the manufacturers, and finally concluded that I could get the best results by wearing one of your legs with rubber foot. I have worn the leg over five years. When I appear on the stage my steps are elastic and never betray the fact that I wear an artificial leg. After having worn your leg about six weeks, I invited the surgeon

who amputated my limb to witness my performance; he invited in turn his medical class. When I was called upon to show my artificial limb, you should have seen the expression on those student's faces—they could hardly believe it.

* BRUNO BERNIER—Carpenter, Quebec. Above knee.

I have worn a leg from your firm nearly a year. I certify that I am greatly satisfied with it. I recommend those that have had the same misfortune as I, to go to you and obtain something good and reliable.—Translated from French. April 25, 1904.

* MRS. A. R. BERST—Greene Co., Mo. Son Titus, Schoolboy.

In regard to the artificial leg you made for my boy in 1902, I can say it has given satisfaction. Titus gets around fine. His limb is amputated 2½ inches below the knee. He has never walked with a crutch or cane from the first time he put it on. June 27, 1904.

MISS MARY E. BEYER—Monmouth Co., N. J. Below knee.

I must say the artificial leg you made for me gives me and all my friends great satisfaction. I can walk better and with more ease than before. I can ride a wheel as well as my friends with two limbs. If anyone wishes to know about my leg I will give all

the information they want. My leg was taken off on the 18th of August and in three months I was wearing your leg with stiff ankle in the most satisfactory way. May 10, 1904.

CHARLES BINGENHEIMER—Farmer, Plymouth Co., Iowa.
The artificial leg you made for me in September, 1902, I have been wearing ever since and I have no trouble. I am satisfied with it. I will recommend your make whenever I can. It is the best artificial leg I ever had. May 6, 1904.

* MRS. JANE BIRD—Worcester Co., Mass. Below knee.
I take pleasure in recommending your artificial limbs. I had the misfortune to have mine amputated half way between the knee and ankle, the future looked dark until you furnished me with a limb fourteen years ago. I wore it continually until you made a new one a few months ago. It is just an excellent fit. I have a large family and do all my housework with ease. June 28, 1904.

* DAVIS H. BISHOP—Miner, Indiana Co., Pa. Below knee.
I have used one of your limbs one year to-day. The rubber foot I am well pleased with, and I am satisfied with the fitting.

My leg is off three inches below the knee. I am a coal-digger, and am working every day. I can walk one mile in twenty minutes. Your spring mattress rubber foot is the best out. May 15, 1904.

* EDWARD T. BIRTLES—Saddler, New Zealand. Below knee.
I have had the artificial leg I received from you in use about a year. I am well satisfied with it and find it far more satisfactory than any I have previously used. It is very light and comfortable to wear and so far is wearing well. The foot retains its shape perfectly. June 6, 1904.

* HENRY J. BISHOP—Teacher, Newfoundland. Above knee.

My leg was amputated two inches above the knee in June, 1897. I obtained a substitute from you in July, 1898. I stand and walk about for hours at a time without feeling the least fatigue. I have on several occasions walked eight or ten miles in a day with it. It scarcely ever occurs to strangers that I am wearing an artificial limb. Hardly any expense for repairs of any kind have been needed during the six years I have used it. A few months ago, however, I ordered and duly received a second limb whose service would be invaluable if my old friend No. 1 should meet with an accident. April 29, 1904.

J. ANDREW BLAKER—Teacher, Augusta Co., Va. Shortened leg.

I have been wearing an appliance of your make for about two years. My leg is six inches short and the ankle is very weak, but with the extension I can walk with ease. My occupation is that of a teacher, and as such, I must stand and walk a good deal. I can ride a wheel, skate, and in fact do anything that I could do with two natural limbs. May 26, 1904.

CLEOPHAS BOLDUC—Baggageman, Quebec. Below knee.

It is with great pleasure I take the opportunity of thanking you for the excellent manner in which my artificial leg is giving satis-

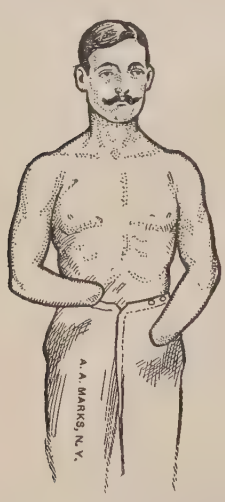
faction. My occupation is train baggageman on the Canadian Pacific Ry. About ten years ago in an accident on the road my left leg was amputated. Shortly afterwards I purchased an artificial one from your firm and it has been in constant use up to about two months ago. My run on the road is 172 miles which occupies seven hours daily, and I have no difficulty in doing my work and have never lost any time and have had no soreness in my stump. The artificial leg recently purchased has the appearance of giving the same good service as the old one. April 23, 1904.

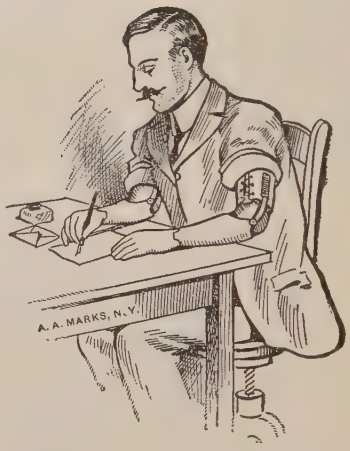
* O. F. BLEVINS—Registrar, Wilkes Co., N. C. Below knee.

I have been wearing one of your artificial legs for about two years and can say that it has given entire satisfaction. I live two miles from our court house and I walk to and from the court house every day. My occupation is registrar of deeds for Wilkes County, N. C. My leg is amputated just below the knee. I take great pleasure in recommending your make of limbs. May 12, 1904.

JAMES G. BRADY—Lackawanna Co., Pa. Both below elbows.

I am writing you a few lines to let you know that I can handle a pen with my artificial right hand. I am at present working for the Lackawanna Iron and Steel company, and am doing satisfactory work. I am a candidate for alderman in our ward and expect to





be elected. I am now registrar of voters and do all my own writing, thanks to you and the useful artificial hands you furnished me. If I succeed in being elected it will secure a position for me that will last at least five years. It will make bigger demands upon my artificial arms, but I have no doubt that they will be equal to the work. The people in our ward say your artificial hands are wonderful when they see me writing.

* JAMES P. BOOTH, M. D.—San Bernardino Co., Cal. Below knee.

My son, John Jerome Booth, aged eighteen years, who had the misfortune to lose a foot about thirteen years ago, has used one of your artificial limbs for the past twelve years with complete satisfaction. Soon after procuring the Marks' limb I concluded to try——, and for that purpose ordered one with lateral motion. Here, then, I had a fair opportunity for competitive trial. As a result, the leg was returned for repairs in six months, while the Marks' was never returned except for lengthening. My son runs, jumps, climbs, and skates as well as any of his companions, and the closest observers, when informed of his misfortune, are at a loss to determine which is the real and which the artificial limb.

* L. BOUTINON—France. Below knee.

I have been wearing the artificial leg you made for me constantly, and it is with the greatest pleasure that I can certify I never felt as comfortable before while I wore other patents. The main objection I made against your system was the absence of the ankle joint, but now I can say, this is the chief merit of your

limbs. I am now able to walk much longer distances than ever before.

* ALLEN T. BOWIE—Court Clerk, Adams Co., Miss. Knee bearing.

In 1883 my leg was amputated below the knee. Have used several makes of artificial limbs and now wear A. A. Marks' knee-bearing one with the most satisfaction. May 7, 1904.

* HAROLD BRADY—Farmer, Cass Co., Mich. Above knee.

In January, 1903, I had the misfortune to lose my left leg, as I was troubled with necrosis of the bone and had to have my leg amputated about six and one-half inches from my body. I got your leg in July, 1903, and have worn it with great satisfaction. I can ride a bicycle and get around with ease. I am fifteen years old and thank you very much for the service and comfort your leg has given me. May 8, 1904.

SAMUEL J. BRADY, M. D.—Brooklyn, N. Y.

Your plain and simple mode of construction of artificial legs is, to my mind, unquestionably the best, and when asked by legless persons as to whose make of artificial limbs would prove the best to secure comfort and utility I most decidedly say, without any hesitation, Marks'.

* ELMER G. BREWER—Farmer, Des Moines Co., Iowa.

The artificial arm and rubber hand purchased of you has given good satisfaction. I am a farmer by occupation and the arm has been in constant use without repairs. The stump of my arm is but six inches long, and the arm fits well, and is all one could expect. May 26, 1904.

C. H. BREWSTER—Truckman, New York City. Below knee.

I have worn one of your rubber foot limbs for about fifteen years with entire satisfaction. My occupation is truckman for the New

York Belting and Packing Company. I help in loading my own truck and frequently lift bales of several hundredweight. The limb has been in constant use.

W. J. BREWSTER—Telegraph Operator. Montgomery Co., N. Y.

I have been afflicted with a shortened leg twenty years and have tried two instruments of different firms which did not prove satisfactory, one made by you has proved to be the best by far. I am employed by the railroad as a telegraph operator, and walk five miles every day, year round. It is a great help to me, it makes me sure and safe and no danger turning over as is easily done with the other makes. May 18, 1904.

A. BRIDGEMAN—Mill Inspector, New Haven Co., Conn.

My leg is amputated below the knee leaving a stump of about six inches, I have worn artificial legs for over twenty-nine years. I have worn two different legs with ankle and toe movements, also three legs of your manufacture, and it gives me great pleasure to state that I have always found your style of leg capable and able to do all that I require of it. My vocation compels me to do considerable walking and am on my feet almost continuously twelve out of twenty-four hours. The last leg you furnished me is giving as good satisfaction as those of the past, and I can express myself no better than by saying that I know your make of leg to be the best substitute for nature in the world. May 11, 1904.

* C. ELLWOOD BRIGHT—Farmer, Caroline Co., Md. Above knee.

I have a leg of your make, and I like it very much, have been using it five years. I have an eight-inch stump from the hip joint, the leg works all O. K. I am farming and trucking, and I do my own work. I have plowed new ground. I believe the Marks' rubber foot cannot be beat. May 19, 1904.

* J. W. BROCK—Traveling Salesman, Boone Co., Ind. Below elbow.

The arm I bought of you about six months ago is a perfect fit in every way. It gives me a great amount of service, such as using a knife, or fork, or brush, holding my paper when writing,

driving a horse, holding my newspaper while reading. When traveling I carry two valises, and the heaviest one in the artificial hand. It is a great help to me in walking, it balances my whole body and helps my looks, and by its use my stump has become stronger. Feb. 2, 1904.

A. J. BROWN—Station Agent, Franklin Co., Vt. Both below knees.

There are quite a number of different makes of legs in and around this place, but none that have stood the wear and usage that yours has. It will be nine years the 30th of this month since I received your legs, and have worn them all the time since, and they are still in fair shape, better than some which have been worn

less than half as long and cost as much, and anyone knowing what a station agent's duties are will know to what they have been subject to. There are none like Marks' for me. May 16, 1905.

* F. M. BROWN—Iron Worker, Valencia Co., N. M. Above elbow.

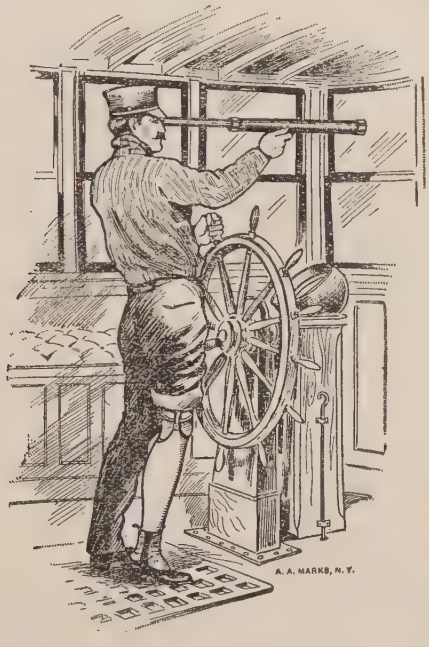
I lost my arm last June by falling from a car, and I have only four inches of a stump left. I was told that I could not wear an artificial arm to any advantage, but the arm you made for me is as much good in looks as the left arm, and very useful. May 5, 1904.

J. E. BROWN—Lawyer, Jackson Co., Ala. Above knee.

I wish to say to you, and to the inquiring public who may desire artificial limbs, that I have been wearing the limb made by you for the last fifteen years, and I find it very satisfactory. I have used several other patents, and believe yours is the best leg made. May 24, 1904.

* J. H. BROWN—Steamboat Pilot, Ohio Co., Ky. Below knee.

I am pleased to say that I find great satisfaction in wearing your leg. I am a steamboat pilot, and sometimes stand on my feet



for 18 to 20 hours, walking a bridge or climbing a ladder just the same as I ever did. I would not be without one for ten times the cost of a leg, and I am ready and willing to give any information I can to anyone in need. May 6, 1904.

J. L. BROWN, M. D.—Saline Co., Neb.

In behalf of Mrs. Dora Schweer, I wish to thank you for the elegant fit and workmanship of the artificial limb we got from you. She does her housework, comes to town, and crosses the streets as easily as she could before the accident. There is not money enough in the country to buy that limb if she could not get another.

* J. W. BROWN—Harness Maker, Jones Co., Ia. Instep amputation.

On or about July 1st, 1903, I purchased an artificial foot for

Chopart amputation of you. Have worn the foot every day since receiving it, and it is giving good satisfaction. I am a harness maker, and on my feet much of the time, but that foot is always ready for business. May 2, 1904.

* JEAN BAPTISTE BRUN—Merchant, France. Above knee.

It is with pleasure that I acknowledge that your artificial leg is excellent. I am no longer a young man, am seventy years of age, and quite heavy. I am well pleased with the leg, and get around satisfactorily.—Translated from French. May 14, 1904.

HENRY BRUNING—Farmer, Passaic Co., N. J. Knee amputation.

I wear a knee-bearing leg with every comfort anyone can wish for, work on a farm, carry from one hundred to one hundred and fifty pounds on my shoulders, and use my leg very rough at times, and do a great deal of heavy trucking. I have worked on a moving van, and in a piano factory, also in a lumber sawmill, in a machine shop, as janitor in a big school, and had a bicycle business of my own. I have had seven other makes of legs in nine years, but the Marks' leg is the "only one." May 9, 1904.

* JOHN BURKLEY—Dancing Teacher, Hamilton Co., O.

I have worn your artificial arm now for five years, using it at the factory for three years. I worked around the factory like

any ordinary man. Since I left the factory I have given my attention to teaching dancing. My artificial arm is so natural that the dancing people do not know which is the artificial one until I tell them—which I don't do very often.

JOHN D. BURHANS—Truckman, Ulster Co., N. Y. Below knee.

I have worn one of your artificial limbs for seven months, and am well pleased with it, do heavy work with it. June 5, 1904.

F. W. BURKE—Brakeman, Quebec. Left at ankle, right below knee.

I am satisfied with the artificial legs you furnished to me nearly two years ago. My limbs were amputated the 30th of May, 1903, and I got my artificials from you December the same year. My

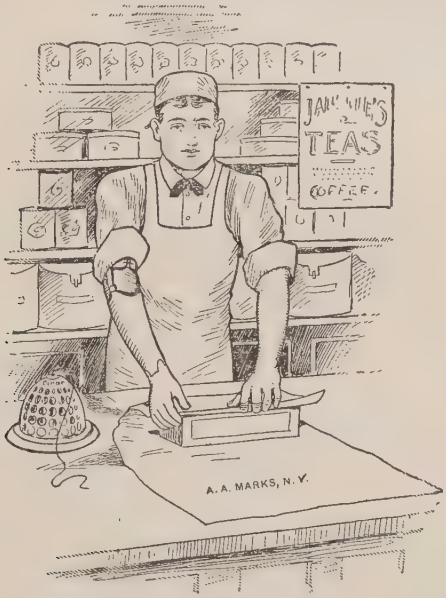
artificial limbs are all right. I have every faith in the superiority of your work; your limbs are unquestionably the best that money can buy, and the best made in the world. April 19, 1904.

JAMES BURTON—Weaver, Oneida Co., N. Y. Below knee.

The last leg I got of you is all right. My right leg is amputated four inches below the knee. I am a cotton weaver, and I run eight looms, and it keeps me on my feet all the time, but when my day's work is over I change my clothes for the evening and walk about the village. I can walk three or four miles at a time and am not tired, and my stump never gets sore. I would not change Marks' leg for any other, it gives perfect ease and comfort. May 15, 1904.

* JOHN BYRNE—New London Co., Conn. Below elbow.

We all know an artificial arm can't be expected to do the same amount of work as the natural one. When I first put your arm on it felt heavy, but now it feels fine, it balances my shoulders



so that lots of people whom I have spoken to since I got your arm hardly know me, they say it looks so real, my friends many times ask me which is the real one. I am in the grocery business for myself. I can do up bundles with the aid of the rubber hand. My arm has been amputated since July 7th, 1897, my stump healed in good shape, it feels much better with the arm. April 28, 1904.

LOUIS BURWELL—Grocery Clerk, Edgecomb Co., N. C. Above knee.

I have a nine-inch stump and wear your artificial leg. No money could buy this limb if I could not get another. My friends all say that anyone not knowing me could not tell that I am wearing an artificial leg. I am a clerk in a grocery store. Your leg gives perfect satisfaction. May 8, 1904.

* EPIFANIO BUSTAMANTE—Barber, Mexico. Below knee.

I am very much pleased and thankful to you for the last leg you sent me. I always recommend you, stating that your make is the best in the world, and whenever I see anyone in need of a limb I

always advise them to apply to you. Words fail to state my thanks for the construction of this last leg. I was always suited with the first one, but I am very much better pleased with this. The reputation of your manufactory is known all over the world. If I were in good circumstances I would not hesitate to take the journey solely for the pleasure of knowing my benefactors, and to give them an embrace as a proof of my gratitude.—Translated from Spanish. May 14, 1904.

* JAMES BUTLER—Fisherman, Newfoundland. Elbow joint.
With much pleasure I send these few lines to you to tell you that I am greatly pleased with the artificial arm you sent me. I am deriving good satisfaction from it. It is a great help in my daily labor, it has been very serviceable, and I hope and believe it will be so as long as I live. May 15, 1904.

* JOHN BUTSON—Farmer, New Zealand. Above knee.
In September, 1899, I was so unfortunate as to lose my right leg above the knee, leaving about six inches of a stump. I was advised to get one of your patent artificial limbs with rubber foot. I have now used it for eighteen months. My occupation is a farmer. I can use it much better than I expected. I think anyone in need of a limb could not do better than use one of your make. June 3, 1904.

* A. H. CAMERON—Teacher, Alberta, Canada. Above elbow.
I am grateful to you for manufacturing and supplying me with an arm which I wear with comfort, pleasure, and satisfaction. The amputation is above the elbow. I would not be without it, it establishes an equilibrium of the body, it has developed my shoulder, by giving it exercise. For these reasons, coupled with the excellence of workmanship, naturalness of form, and superior quality of material in your limbs, I recommend them to all who may need such. May 26, 1904.

* D. CAMPBELL—Horse-dealer, Ransom Co., N. D. Above knee.
In regard to your leg, must say it has given me good satisfaction. I have only about an eight-inch stump. I am a farmer and horse-dealer, and find it necessary to be on my legs from twelve to sixteen hours a day. Have not run across anyone wearing an artificial limb that could be on it more hours a day than I. May 2, 1904.

* FERNANDO CAMPOS—Brakeman, El Paso, Co., Tex.
I have pleasure to certify that the artificial leg which you had the kindness to send me in February, 1903, is giving me entire satisfaction. I cheerfully and conscientiously recommend your work to others. May 3, 1904.

* B. L. CANTRELL—Driver, Marion Co., Ala. Below knee.
About two years ago I had my left foot amputated just above the ankle joint, and procured from you an artificial leg, which I have been wearing for more than a year with good results. I drive a mail wagon, and could not ask for anything better in line of an artificial leg than the one you sent me. May 23, 1904.

* C. G. CARD—Carpenter, Somerset Co., Me. Below knee.
My artificial leg is perfect. I am much pleased with it. I put the limb on two months after amputation, and have worn it ever since. I am a carpenter by trade, and do the work of carpentry in all its branches. I would advise anyone in need of an artificial limb to select yours in preference to all other kinds. They are light, strong, and reliable. July 17, 1904.

W. L. CANFIELD—Towerman, Orange Co., N. Y. Instep amputat'n.
The artificial foot you made for me February 1st, 1903, is giving good satisfaction, and I would wear no other make. Have been wearing artificial limbs for the past ten years, and find your patent to be far the best for ease and comfort, and to work on,

can do my work as good as though I had my own foot. I work in a tower throwing twenty levers for twelve hours a day, and am on my feet all the time. My foot is amputated in the instep. Cannot recommend your patent too highly. I have worn other makes, but could get no comfort out of them, and one caused another amputation. May 16, 1904.

* MRS. FRED. CARDINAL—St. Lawrence Co., N. Y. Below knees.
I have worn a pair of artificial legs since December 5, 1903. I have never used a cane or crutch since I got them. My husband runs a big farm. I milk eight cows nights and mornings. I am on my feet from six o'clock in the morning until eight and nine at night. and am not any more tired than I would be if I had natural legs. I do all my housework, have three children, a hired man, and my husband, that makes six in the family. I do my own sewing on a sewing machine and can run the machine as well as any woman with her own feet. I do a good deal of work in the garden. I had my limbs taken off about fifteen years ago by the cars, one is seven and a half inches below the knee, and the other four and a half inches below the knee. May 16, 1904.

* JOHN HENRY CARDWELL—Lumberman, Rainy River, Ont.
The leg with rubber foot received from you for knee joint amputation I have worn every day. I had it just two weeks when I started for the bush for my winter's work. This is my second winter in the woods, and have every comfort with the leg. I can pick a hundred pounds up and carry it easy. I don't think there is a limb made that gives the satisfaction your rubber foot gives. It is light and comfortable. May 11, 1904.

JOHNNY CAREY

On the evening of June 7, 1888, stole into the yards of the railroad depot at Utica, N. Y., with an armful of papers. It was his intention to board an express train which was about due. The train was late. Johnny sat upon the platform step and fell asleep. When the express came it ran over his leg and mangled it in a frightful manner. Johnny's first thought was that the yard-

master had got hold of him and that he had better get out of the way. In his efforts to get up he was brought to realize the fact that he had been run over. The depot men picked him up and took him to a neighboring hospital where the surgeons amputated the mangled leg. Johnny made a quick recovery, and soon got about on crutches. A few sympathizing friends contributed enough money to buy one of Marks' artificial legs. Johnny soon learned to walk, and resumed his newspaper traffic. Ever since then he has been going about so naturally and comfortably that nobody suspects that he is the same Johnny Carey who met with the frightful accident in 1888; he is able to run, walk, jump on and off cars just as well as other boys, and he manages to sell as many papers as any of his fellow-newsboys.

* JAMES CARLING—Miner, New Zealand. Below knee.

The artificial leg you made for me has given every satisfaction. It has enabled me to follow my occupation as a miner with the least possible inconvenience. I gladly recommend your work. June, 1904.

* SAMUEL E. CARLISLE—Coach Driver, Penobscot Co., Me.

I have worn one of your artificial legs for nearly six years, and have found it to be just what you claim.

* J. D. CARPENTER, M. D.—Phelps Co., Mo.

I take great pleasure in recommending your artificial limbs, especially for their durability and superiority of the rubber foot over all others. My left limb is amputated just above the knee joint. I have worn one of your limbs since April, 1884, and it has not cost me one cent for repairs to this date; I walk easily without a cane, and have no difficulty in following my profession.

LAWRENCE CARRINGTON—Drug Clerk, Marshall Co., Miss.

The artificial leg Dr. Hayes ordered for me for which he took measurements and sent them to you has been in use for a month. I put it on the same day I received it, and have been wearing it continuously since and have had no trouble whatever. My stump is only eight inches long from the body. February 18, 1905.

* L. A. CARROLL—Barber, Monroe Co., Miss. Below knee.

I suppose you are aware of the fact that I have been wearing one of your artificial legs for over four years. I think myself the best

one-legged man in Misissippi, from the simple fact that I am wearing one of your artificial limbs. I am a barber by trade, I stand at my chair fourteen to sixteen hours each day, and work hard. I have won two races on my bicycle; I can ride as far as any man in town, and just a little faster. This is my first opportunity to tell you what I think of your limb.

* THOMAS CARROLL—Cook Co., Ill. Ankle amputation.

In regard to the artificial limb which I purchased of you, I wish to say that I cannot praise it too highly. As my work requires me to be on my feet all day, the leg gives me no trouble, but is easy and comfortable. May 14, 1904.

W. H. CARRUTHERS—Clerk, Ontario. Below knee.

The leg made for me in August, 1902, has been in use every day. My amputation is six inches below knee joint. I was run over by an engine on the Grand Trunk Ry., November, 1877, when I was sixteen years old, I have worn leather legs with wooden feet and

ankle joints, and have never found myself satisfied till I got one of yours. My stump was always sore with the leather leg, especially in warm weather, but since I got one of yours with rubber foot, I have no such trouble. There is nothing like the rubber foot, it feels just like walking on your bare foot, and I dont have any trouble with rattling joints, and thumping the side walks as I did with wooden feet.

* JACOB CASE—Mason Co., Ky. Below knee.

I bought an artificial leg from you for my boy in the year 1902. I sent you measurements and had it constructed by them, as soon as the leg was received I had it applied, and the young man walked on it, and has never been without it one day since. He went to work the Monday after he received it, those that saw him before the leg was applied did not know him when he walked around on two legs. He can run, skate, and walk as well as any boy. May 22, 1904.

MRS. MARY CASSIDY—Housewife, Brooklyn, N. Y. Below knee.

I take pleasure in informing you that my artificial limb is a great success. It has given me perfect satisfaction in every way. I am able now to attend to all my household duties without the slightest inconvenience. May 9, 1904.

* GEORGE CASTLETON—New Zealand. Above knee.

I am now working for the same firm I worked for when I met with the accident, engineering and engine driving. I walk very well, indeed. I think the rubber foot is a great thing, as it does not jar, and the leg is so strong that it is not easily broken. I give it severe tests at my work.

SERAFIN CAULA—Clerk. Above knee.

It will soon be a year since I was at your establishment in search of relief, my deplorable condition was caused by an amputation in the upper part of the right thigh, leaving a stump only four inches in length. I had a leg made by another manufacturer, but was unable to walk on it, in spite of having practiced assiduously for more than six months. Completely disheartened I believed that I should never walk, I resolved, however, to go to your manufactory as a last resort. In ten days you furnished me with a limb so perfectly adjusted that I have used it constantly with ease and comfort. Although my occupation as a Government employee obliges me to sit most of the time, I take plenty of exercise and walk perfectly.—Translated from Spanish. April 30, 1904.

ROBIN CELLS—Rockland Co., N. Y. Above knee.

The leg you made for me two years ago is as sound as when I got it, although it has had several hard knocks. My leg is amputated above the knee, leaving a stump of 7½ inches, I get around very good, and think nothing of walking two or three miles. I find the socket very comfortable, it never chafes the stump.
May 20, 1904.

FRANK L. CHAFFEE—Farmer, Bedford Co., Pa. Below knee.

The foot I bought of you is giving good satisfaction. I have now had it two years. I am farming, and can plow, drag, and do all kinds of work with it. The foot I had before this, made by another firm, always caused me a great deal of trouble. I am well pleased with your work. May 2, 1904.

R. M. CHAMBLISS—Banker, Haywood Co., Tenn. Below knee.

It gives me great pleasure to say that the limb you made for me in March, just six months after I lost my leg by falling under a moving train, has given me perfect satisfaction, and I believe will continue to do so. I have worn it every day since getting it, and have suffered no pain or had any sores of any kind on my stump.
June 7, 1904.

* E. S. CHARLOTTE—Painter, Craven Co., N. C. Below knee.

The artificial leg I got of you in May, 1897, is still in use. It has required no repairs. I work all day on a long ladder, I am a painter by trade. Have walked five miles in the summer time without any trouble. I advise anyone in want of a limb to get one of your make. June 3, 1904.

* DOLPH CHEEK—Salesman, Alamance Co., N. C. Below elbow.

It gives me great pleasure to say that the artificial hand made and fitted from measurements is perfect in every respect. People do not suspect me to be a one-armed man, as the "artificial hand"

looks so natural. I can hold a book or paper in my rubber hand. With the hook and ring attachments I can do most any kind of work, people are surprised to see how well I get along. I can write with my hand, hold a knife to trim the finger nails on my left hand. Dec. 19, 1904.

* W. R. CHEVES—Supt. Sawmill, Berrien Co., Ga.

I lost four fingers and the palm of my right hand in 1896, about a year afterwards I bought from you an artificial hand. This hand has never given me any pain by reason of contact with the stump, besides being of considerable service, it hides the evidence of maimedness. I would advise anyone in need of an artificial limb to go to you. May 16, 1904.

CARROL CHILDES—Davidson Co., Tenn. Below knee.

I am glad to say that the limbs you have manufactured for me from time to time have been very satisfactory, I can recommend your work as superior to any other that I have seen, and I am acquainted with pretty nearly all. Your name is enough to make your limbs travel everywhere. April 28, 1904.

* JOSE TEMISTOCLES CHIRINO—Soldier, Venezuela. Above knee.

The duty which my gratitude imposes upon me, compels me to make the following statement.

I was wounded in the leg in one of the battles of the last war by a Mauser bullet. The projectile smashed the bone in such a manner that I at once became crippled. Lack of means and medical attention occasioned many complications, and after six months of great suffering, I came to this city where they performed the operation, as the only means of quieting the pain. Shortly afterwards my physician, Dr. Pedro Leon, A., advised me to write to

you for the purpose of procuring an artificial limb which would replace the one I lost. In truth you sent it, and it has greatly exceeded my expectations. I have only used it a very short time, and I walk without any trouble and am again engaged in my usual occupation. It is not heavy, neither does it tire me, nor pain my stump and does not inconvenience me in any way.—Translated from Spanish. May 7, 1904.

GEORGE L. CHILDS—Chauffeur, Essex Co., N. J. Below knee.

I have been wearing one of your legs for over a year, and have

found it the best in the world. I have been chauffeur for nearly two years, and have been driving the Peerless motor car with good results. I can recommend your limb to anyone in the world, and I will be glad to do so. May 7, 1904.

* CHARLES W. CHRISLEY—Farmer, Pulaski Co., Va. Below knee.

I am well pleased with my artificial leg. I can walk fine. I never thought that I would be restored to my usefulness as I am. I could not have made a better choice than I did when I purchased of you. The leg fits perfectly. March 14, 1905.

* E. H. CLARK—Engineer, Middlesex Co., Mass. Shortened leg.

I have worn one of your extensions for about twenty years, and am perfectly satisfied with it, and would have no other. I am an engineer, and it gets pretty hard usage. May 20, 1904.

J. HENRY CLARK, M. D.—Essex Co., N. J.

I cheerfully and fully indorse the Marks' rubber hands and feet. I have several patients using them, and with perfect satisfaction.

* V. B. CLARK—Jones Co., Ga. Below knee.

I lost my foot in the battle of Spotsylvania, May 10th, 1864, and have been wearing A. A. Marks' artificial limbs for some twenty years, tried other kinds, none suited me half so well as yours, for comfort and durability; I do not believe there is any made on earth to equal Marks' limbs. My new foot has given me no trouble from the day I received it, have worn it constantly. May 19, 1904.

* HARRY T. CLARK—Farmer, Belmont Co., O. Below elbow.
In regard to the artificial hand I got of you, I received it the first of April, 1902, and have worn it constantly, and find it of great use in the different works that I have to do. I work on the

farm until the fall of the year, then I have a steam hay press with which I travel around the country baling hay for the farmers. The first year I received the hand I pitched wheat for three wagons. To make a long story short, I get along with the hand nearly as well as I did when I had both of my own hands. May 10, 1904.

* W. A. CLARK—Lumberman, Choctaw Nation, Ind. Ty. Above knee.
The leg I bought of you some twelve years ago is now laid aside for the new one just received. I was formerly in the lumber business; handled lumber, rode horseback, and a great many people making my acquaintance never knew that I used an artificial limb. The new one bids fair to be as good. The fit is excellent. May 23, 1904.

* PERCY T. CLARKE—Student, Hancock Co., Me. Below elbow.
My artificial arm was received about four years ago, and has given me untold help and comfort. The looks alone are worth more than the price. May 31, 1904.

* T. P. CLARKE—Farmer, Russell Co., Kans. Below knee.
My limb is amputated about two inches below the knee; has been off for twenty years. I have worn two of your limbs, and can recommend them highly, especially for strength and durability. Mine has had hard wear on a Kansas farm. April 30, 1904.

* MRS. ANNIE CLEMENTS—Saginaw Co., Mich. Below knee.
I have been wearing the Marks' artificial leg twelve years, the first one I ordered I used constantly ten years without having any repairs made, then I concluded I had better order another so as to have an extra one, in case of need. I used the artificial leg with

ankle movement for eighteen years before I got the one from A. A. Marks without ankle movement. I have no further use for ankle movements. After the first year they are not reliable, and they make so much noise. I have always cared for and done all the housework for a family of seven. May 11, 1904.

REV. I. N. CLEMENTS—Madison Co., N. Y. Knee-bearing.

I have worn an artificial limb of your make for about twenty-three years. Previously I had worn one of a different manufacture, but I did not like it. Since wearing your make I have walked more easily, and with no noise.

* FRED CLOWES—School Teacher, Australia. Both below knees.

I have much pleasure in recommending your artificial limbs to all who are afflicted as I am. Your legs have made such an improvement in my appearance, that strangers cannot tell that I have lost both of my natural ones until some person tells them. The legs felt a little awkward the first fortnight, during which time I was forced to use two sticks, but before long I could walk without the aid of them. This may be considered very good progress seeing that I never used my knee joints until I got your artificial legs. June 7, 1904.

* J. D. CLUCK—Farmer, Cherokee, Ind. Ty. Above knee.

In July, 1884, I accidentally split my right knee-joint with an ax, which limb, three days later, was amputated four inches above knee-joint, leaving an eight-inch stump. In January, 1886, I purchased my artificial leg of you by sending measurements taken

by one of my neighbors and myself. I am now compelled to say that, after about ten years of constant use, I feel confident I made no mistake in taking your patent. I often walk to church, over a mile, in company with others. My chief occupation is farming, I often saw wood all day, or I can pick a hundred pounds of cotton in a day, and that is about the amount I picked before my leg was amputated.

JAMES COLE—Farmer, Crawford Co., Pa. Below knee.

The leg you made for me is the best artificial leg that I ever wore, and I can't speak too much in praise of it. I think the rubber foot is a great improvement over any other make. I shall get your make of limbs hereafter. I lost my leg in the war. May 13, 1904.

* ALLEN COLEMAN—Watchman, Hale Co., Ala. Below elbow.
I bought from you in July, 1903, an artificial arm and hand for amputation five inches below elbow. I have worn the arm every day, and have not had one moment's trouble with it. I have charge of two tanks on the Southern Ry. and I fire my furnace. The other day I went on top of one of my tanks, which is about twenty-five feet high, and spent about four hours calking the top of the tank, carrying a bucket of white lead and a fourteen-foot ladder around the top of the tank. The arm was made from measurements, and the fit could not have been better if I had been at your factory. May 1, 1904.

* JOHN COLIGHAN—Barber, Schuylkill Co., Pa. Below knee.
In regard to your rubber foot, would say that I am well pleased with it. It gives me better satisfaction and more comfort than any other that I have worn. I am a barber, and the leg is giving the best of satisfaction. I am wearing your artificial leg for nine years, and your foot is the only one I can wear at my trade with comfort. May 11, 1904.

* ISAAC COLLINS—Fisherman, Newfoundland. Below knee.
I am thankful for my artificial leg. I am able to walk three miles over ice, and do my work the same as when I had both natural legs. I am able to take my gun as usual and go shooting. I am able to go in my boat as I did before. This artificial leg with rubber foot can't be excelled unless you get the blood circulating in it. April 30, 1904.

* CLODOMIRO CONCHA—Clerk, Chile. Below knee.
I am pleased now to communicate the following, viz.: I had scarcely worn the artificial leg with rubber foot, which you made for me, two months, when I resumed my former position in the firm of Williamson, Balfour & Co. The fulfillment of this position demands constant work at all hours of the day and a portion of the night. In spite of this, and the constant exercise on foot and on horseback, I am completely comfortable. Fatigue and pains are unknown to me, although I am as active as in my best days. Those who are ignorant of my misfortune are astonished, and refuse to believe that I wear an artificial leg, the perfection of the apparatus is so great.—Translated from Spanish.

STEPHEN J. CONDIN—Worcester Co., Mass. Below knee.
Having worn one of your limbs for two years I can truthfully recommend them. May 10, 1904.

R. V. CONLEY—Railroad, Providence Co., R. I.—Below knee.
There is as much difference in artificial limbs as there is in folks, and sometimes more. I wish to thank you for the kindness shown me during my stay at your place of business. I must say it is really a pleasure for a man in my condition to be measured and have a limb made by your firm. My limb is one good success. It is impossible for me to say too many good things about your work. April 22, 1904.

* JOHN CONNER—Miner, Clearfield Co., Pa. Below knee.
I take great pleasure in recommending your legs to any person working in or around the coal mines. I wear one of your feet for below knee amputation, and can walk as well as before I lost my limb. I have to push heavy cars, which I handle with as much ease as ever. I have worked with people a long time before they knew I wore an artificial foot. May 23, 1904.

* WM. P. COONROD—Teamster, Erie Co., N. Y. Below elbow.
The artificial arm you made for me about eighteen months ago is all right. My occupation is teamster, and I can handle a team with it. I use the hook while at work. I use the hand for brushing my coat, and get along all right. May 24, 1904.

* JAMES W. COPELAND—Musician, New Brunswick. Below knee.
Your artificial limb has given the very best of satisfaction, and it is impossible to tell that I wear one at all. I am a musician, and leader of a band, and sometimes have to walk long distances, as at

parades, a person has to be pretty well supplied with limbs to stand that, the routes of parades being about five or six miles, and sometimes more. Well, the Marks' leg just suits me, and my artificial limb is just as good as the natural for that purpose. Apr. 30, 1904.

G. A. CORBETT—Sheboygan Co., Wis. Above knee.
I consider it my duty, and everyone else that wears an artificial limb, to tell the public, especially those that have to wear them, their candid opinions of the legs they are wearing. I have worn no less than five different makes, and give yours the preference. The action of the knee joint is far preferable to me than any other that I have worn, and I know the very best material is used. No one can help but feel at home as he goes into your building, everything reasonable they ask will be granted to them. April 25, 1905.

* FRANCOIS CORRIVEAU—Farmer, Bellechase Co., Que.
I have worn the artificial leg you made for me last September and am highly satisfied. I am a farmer, and do my work the same as my neighbors who have their natural legs. I thank you for the interest you have taken in the case, and take pleasure in encouraging everybody in need of an artificial limb to address you.—Translated from French. May 21, 1904.

W. T. COREY—Rutland Co., Vt. Above knee.

For about two years I suffered from diseased bone in my knee-joint. On the 13th of May, 1903, my surgeon found it necessary to amputate above the knee, leaving an eight-inch stump, and on the 15th of July I came to your factory and purchased an artificial limb with rubber foot, which I am wearing now. I began work on the 27th of August, and since then have not missed wearing it a

day. My work is in a milk skimming station and grocery store combined, where I have heavy barrels, boxes, and milk cans to handle daily. It was some time before people here knew I wore an artificial limb. May 10, 1904.

* JAMES COSTELLO—Fisherman, Newfoundland. Above knee.

Its fitting is good, I can get about all right on it. I had to throw away the old imitation leg altogether. I can walk now without the aid of a stick. June 3, 1904.

W. A. COTTERILL—Conductor, New York City. Above knee.

I have had such excellent service from the artificial leg you made for me in 1887 I am willing to say anything commendatory of your work. The leg has been in constant use for fourteen years and is in excellent condition now. I shall probably wear it a great many years longer. The rubber foot is helpful and never gives me any anxiety as to its durability. June 13, 1904.

JOSEPH COUTURE—Quebec. Both legs amputated.

It is two years ago to-day that I began wearing your artificial legs. I have one artificial leg below the knee and the other above. I am well pleased and get about my business with the help of a cane without the least difficulty. I feel well satisfied and recommend the A. A. Marks' artificial limbs. April 25, 1904.

JAMES A. CRANDALL—Clerk, Philadelphia Co., Pa. Below knee.

I have been wearing your patent artificial leg for some years and in my opinion your leg is far superior to any other made, because of its ease, elasticity, and stillness. These are obtained by the use of the rubber foot. Also because of the durability. I have no trouble in the least to get around. I can ride a bike, play ball,

in fact I go in for all out-of-door sports. I cheerfully recommend your legs to all needing them. May 5, 1904.

* W. L. CORGAN—General Store, St. Louis Co., Mo.

I have worn a pair of Marks' legs for about eleven years. My left leg is off about five inches above the knee, and the right is off five and one-half inches below the knee. My legs were made from measurements taken one thousand miles from New York by myself, assisted by a friend. I have never seen New York or Marks' factory, and they have never seen me. In ten years I don't think I have spent ten dollars for repairs. I have seen lots

of wearers of other legs, and have yet to see any in my condition that could walk with me. I am in the general store business, and work in all the departments, not now and then, but every day in the year from early until late. My first pair of legs lasted a little over nine years. Am now wearing my second pair. Therefore, brothers, don't be discouraged if you get a leg or two cut off, for if you are the right kind of stuff, there is lots of fun here for you yet. I belong to the Improved Order of Red Men, am on the degree team and help do the work, and also an Odd Fellow.

April 26, 1904.

* JOHN CRAWFORD—Miner, Athens Co., Ohio. Below knee.

This is the second artificial leg I have bought of you and can say that both have given the best of satisfaction. I have worn four artificial limbs. The first I got was worth about ten cents. The next was nearly as good. The third one was from you and it gave such good satisfaction that had it not been for a fire in which my leg and nearly myself were burned up, I dare say I should have been using it yet. My occupation, that of a miner, requires an artificial limb that is nearly indestructible. Yours comes nearer that, besides giving greater comfort than any I have heard of. The persons wearing your artificial limbs around here have nothing but praise for them. May 16, 1904.

* ENRIQUE P. CORTEZ—Sonora, Mexico. Both legs.

I am pleased to inform you that I have used the artificial leg and part of foot you made for me. They enable me to mentally lay aside the sad fact that I am a cripple. I am a captain in the Federal Army of the Mexican Republic. My right foot and toes of the left was frozen and became gangrened in 1893, when I was caught in a severe snow storm in an expedition to the Sierra Madre. You made a right leg for me in 1893 and with slight repairs made in 1903 I find the leg in a condition as good as new promising at least to last ten years longer. For this I am very grateful to you. My right leg was amputated at the ankle joint. The end sloughed and I have no flap or cushion on the end of the bone. Therefore, I do not or cannot bear any weight or pressure on the end, but the leg which you constructed applied weight and pressure some distance above the end, and inconvenience is not felt in the least. I walk perfectly over rough ground, ride well on horseback, and in

short, although I have lost one leg and part of the other foot I am enabled to continue in the service of my country. I certainly feel very grateful to you for the good work you have done in the way of repairing me.—Translated from Spanish. April 28, 1904.

* S. S. CROCKETT—Machinist, Carter Co., Tenn. Below elbow.

The artificial arm and rubber hand I ordered of you in December, 1902, gives perfect satisfaction. I do not think there could be anything gotten up to equal it, in fact, hardly anyone notices that I am wearing an artificial arm. Being a machinist and an engineer, it enabled me to follow my profession. I also handle a steam log-loader and have to handle the lever that swings the loader from right to left with my artificial hand. I can file and hold a chisel, in fact, it is surprising to know what can be done with an artificial hand. April 30, 1904.

* JAMES P. CROSBY—Worcester Co., Mass. Below knee.

Having worn an artificial leg procured from you I can say that after an experience of over twenty years with different makes, yours with the rubber foot is the most comfortable I have ever worn, and as it was fitted from measures, and without any alter-

ations whatever, I thought it phenomenal. I have not expended a cent for repairs, and it is as good as the first day I put it on. I am on my feet most of the time. May 12, 1904.

JOHN CROWE—Truck Driver, Washington, D. C. Below knee.
Permit me to extend to you my congratulations on attaining such a high state of perfection in artificial limb making. I lost my left leg about three inches below the knee by reason of a gunshot wound in the Civil War. I resorted to the use of an artificial leg and though I wore several other makes, none pleased me till I had a trial of yours which far surpasses all others, and the rubber foot improvement I consider ideal, not only on account of its noiselessness but also for its elasticity and safety. I have worn several of your make all to my entire satisfaction and though I do some heavy work, in all cases they sustain the strain which many times is very severe. Weigh over 180 pounds, get about quite actively and attend to my daily duties with ease and comfort. May 10, 1904.

* REV. H. L. CRUMLEY—Fulton Co., Ga. In charge of an orphan asylum, in behalf of an inmate he wrote:
We have found the artificial limb you made for "Leona Miller," a small girl in our Orphans' Home, durable, serviceable, and with the occasional lengthening very satisfactory. She is now nearly grown and finds the leg indispensable. June 22, 1904.

* A CRYSLER—Barber, Montcalm Co., Mich. Below knee.
I have worn your make of artificial limb for thirteen years and have always found it satisfactory in every way. I think the rubber foot is the best foot made. April 27, 1904.

* MISS MARY E. CURRY—Worcester Co., Mass. Hip amputation.
My right leg was amputated at the hip joint in 1901. I received the artificial leg in April, 1902, and began to use it immediately. I found no difficulty in learning its use and after a few weeks was able to walk anywhere without assistance and with very little limp. I can get on and off cars, climb stairs, in fact do most anything with it. May 10, 1904.

* HENRY CURTAIN—Canvasser, New Zealand. Below knee.
Five years ago while loading wheat on my cart at Auckland wharf a full sack fell on my leg. After suffering sometime it was discovered that gangrene had set in, and as a result my leg had to be amputated just below the knee. I obtained an artificial leg with patent rubber foot from you and after giving this four years' hard and satisfactory wear I decided to obtain another. My object in so doing was to make sure that I should not be left without, were your firm to retire from business. I have been wearing both legs alternately for the past twelve months without discomfort. My present occupation, which I have followed since my recovery, is that of a tea canvasser. This vocation necessitates a well-fitting leg and one that can be relied on. I have already recommended your firm to unfortunate fellow sufferers, and will continue to do so in future. January 10, 1905.

B. CYR—Tailor, New Brunswick, Hip joint amputation.
I must say that I am perfectly satisfied with my artificial leg. As you know, it is a hip joint amputation. I can walk in the house without a cane. Of course on the street I use one. April 23, 1904.

* HARMON DAILY—Clerk and Farmer, Essex Co., N. Y.
In the fall of 1891 I lost both of my feet by slipping between two coal cars on the D. & H. R. R., my right leg was cut off one and a half inches below the knee and my left about four inches below the knee, after the stumps got healed, my doctor recommended to me A. A. Marks as the best limb manufacturer in the country. I pur-

chased a pair of legs from him and put them on the same day. My occupation is that of clerk and farmer. I have to be on my feet sixteen hours out of every twenty-four. I can follow a plow or hoe and can do almost anything that I did before I lost my legs. I can climb a ladder no matter how tall and when I get to the top I feel as safe as I would be on the ground, for there is no ankle joint in the Marks' leg to get out of order. The limbs I am now wearing I got over thirteen years ago and they will last me sometime yet. A year ago I purchased another pair of the Marks' legs with some improvement over the old ones, made from my own measurements and are very satisfactory. May 20, 1904.

WM. T. DALBY, M. D.—Apache Co., Ariz.

I have had various opportunities of testing the merits of the Marks' artificial limbs with rubber feet and hands and can cheerfully recommend them to be superior in every respect to any other which has come under my observation.

REV. C. H. DALRYMPLE—Butler Co., Neb. Above knee.

After wearing a limb for eighteen years I know how to appreciate one. Your foot movement is so noiseless and easy that I'd not think of going back to my old style. At first I thought I never could use it, but in a very little while I found I could. It has grown better and better right along and is now comfortable and works naturally.

* Z. T. DANIEL, M. D.—Physician, Pine Ridge Agency, S. D.

In September, 1899, I performed the operation of amputation of the left leg on Ceca Yammi (Peter Three Thighs), a Sioux Indian

attached to this agency. He was suffering from necrosis of the tarsus, and a complete invalid, absolutely unable to stand. I did not succeed in getting his consent to operate until I told him about

your excellent limbs, how he would be enabled to walk, run, ride, work, etc. In due time the stump healed, and I sent you measurements for his leg. It came by express, and I immediately adjusted it. To my surprise it fitted him perfectly, and at this writing he is going about among the Indians with as much ease and comfort as could be desired. Inclosed is a photograph in war costume which he sends you with his compliments, with a hope that it will be interesting to his race, and an example of what the "White Medicine Man" can do for his people.

EDWIN D. DAVIS—Locomotive Engineer, Potter Co., Pa.
My arm was amputated five inches below the elbow a little over two years ago. I secured one of your artificial arms. It fits perfectly. I have worn it every day since I received it. I have been employed in the railroad company's general store and could not get along without the artificial arm. April 30, 1904.

* V. P. DAVIS—Stenographer, Henrico Co., Va. Knee amputation.
Referring to the limb which I bought of you some time ago will state that I can, with much pleasure, testify to the beautiful piece of workmanship you gave me. I am a stenographer and from time to time have long distances to walk, and can say that I have had no reason to complain of the least bit of discomfort wearing your limb. The rubber foot is the greatest invention in artificial leg construction. May 17, 1904.

WILLIAM B. DAVIS, M. D.—Weschester Co., N. Y. Above knee.
I had the misfortune to lose my right leg when I was six years old. At the age of eight I tried my first artificial limb. My profession compels me to be on my feet the greater part of the time. I feel no fatigue whatever. I can say this, that having used one of Marks' artificial limbs I feel I can never get along without one.

* MISS FLORENCE DAWSON—School Teacher, Buchanan Co., Mo.
I am delighted to tell you that my new limb arrived a few days ago and is a perfect fit. I adjusted it the same day I received it and have been wearing it ever since. It is very satisfactory. Am simply "tickled to death" with it. Can never praise your firm enough. Without you there would be so much less happiness in the world. May 2, 1904.

* HARRY S. DAY—New Zealand. Below knee.
I have used one of your artificial legs for the last four years and a half and I have found it most satisfactory. I consider that the state of perfection that you have reached with artificial limbs is wonderful. I can work and do almost all the things I could do before my accident. I work principally in my butter factory, but also ride a great deal and use many farm implements. I have much pleasure in recommending your artificial limbs to anyone.

* PETER M. DEANS—Signalman, Ontario. Below elbow.
I am pleased to state that the artificial arm you sold me about fifteen months ago, which was fitted from measurements, I have worn it day and night without pain, ache or mark on the stump. I have seen a number of other patents but I do not think they can be compared with your rubber hand in any respect. I am employed as signalman and can attend to my duties without the least trouble. April 26, 1904.

A. C. DEDRICK, M. D.—Bristol Co., Mass.
I certainly advise the application of artificial legs to growing children as soon as their stumps are properly healed. John Kershaw, a young growing lad, has worn one of your legs for some time. He plays football, baseball, and indulges in all other sports.

* DAVID DAY—Millard Co., Utah. Above knee.

Two years ago I put on one of your artificial limbs. I can truthfully say it has been a great help to me, and I am confident that there are none better. I get along without any other assistance,

and am able to attend to an acre and one-half of garden. In fact, to make a long story short, everything is as you said it would be, and I am satisfied.

C. J. DINEEN—Glass Cutter, Steuben Co., N. Y. Below knee.

In July, 1902, you constructed an artificial leg for me, my leg having been amputated above the ankle joint in 1883 on account of railroad accident. I am pleased to state that your leg has proved serviceable and satisfactory. I use it constantly and do anything that I want to. I cannot help but speak well of your work as the leg has always given me good satisfaction. April 21, 1904.

MRS. J. W. DeREVERE—Wyoming Co., N. Y. Above knee.

I have worn your make of artificial leg for a little more than nine years, and I cannot speak too highly of the rubber foot. Although my work is not laborious I walk a great deal. I would recommend your make in preference to any other.

* BERNARD DETERS—Farmer, Clinton Co., Ill. Above knee.

I am wearing one of your artificial legs, and am getting along fine. I wear it every day and do almost any kind of work on the farm. Last winter I went to school and one morning was obliged to walk through fourteen inches of snow. I also walked the same distance on sleet-ice and did not feel tired. I was at the World's Fair and saw other makes but they seemed only a shadow of yours. I would not give mine for any other make. July 15, 1904.

DAVID D. DEUTSCH—Mechanic, New York City, N. Y. Ankle.

My foot is amputated at the ankle joint. I have worn several makes of limbs, but after I wore your make I found it far superior in every respect to any other. I am satisfied with it. I am a mechanic, am a good deal on my feet and think nothing of a ten mile walk. May 18, 1904.

PACIFICO DIAZ, M. D.—Argentine Republic, South America.

I am extremely pleased to salute you, and to enclose with these lines the order made by my friend, Mr. Raul Cordeiro, for an artificial leg to replace the one he has lost. I have taken the measurements for him, and hope that your firm will make a leg for him as perfect and as useful as those made for others whom I have sent your firm in the same manner. Those I am wearing myself continue to give excellent service.

* JOHN A. DICKSON—Telegraph Operator, Assiniboia, Can.

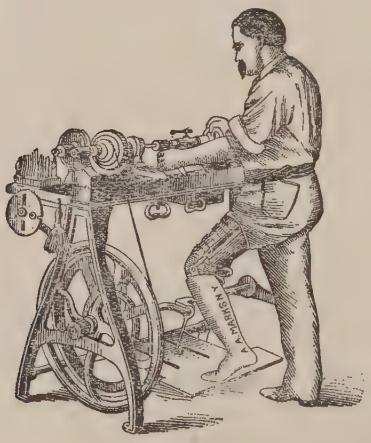
It is almost two years since I lost my arm. I was railroading at that time and got caught in a coupling, causing amputation above the elbow, leaving a stump six inches long. I decided to get one of your arms, and had my measurements taken. When I received the arm I put it on, it proved to be a splendid fit, and I have found that it is no bother to wear, and does not hurt in any way. I advise anyone who has lost an arm to purchase one of yours, and am sure that he will never regret it. I am now working for the Canadian Pacific Railway Co., as assistant agent in one of their offices, and have not the least trouble to do my work. April 30, 1904.

* C. C. DIDIER—Grocer, Cook Co., Ill. Below knee.

Fifteen years ago I lost my foot in an accident with a mower. I then purchased a limb, thinking that it was the best in the market, but it did not give satisfaction. I then heard of A. A. Marks' limbs with rubber feet, I purchased one, and in all the years that I have worn it, I must say that it is the best on earth. I have a grocery store, and do as much work in walking and lifting as anyone, I am on my feet all day, and I could not do it with any other limb than yours with rubber foot. May 17, 1904.

WILLIAM DIETZE—Machinist, New York City. Below knee.

I lost my leg below the knee from gunshot wound received in the late war. As soon as my stump healed the United States Government presented me with one of ———'s legs with an ankle joint.



I wore it for a short time, and thought I liked it, but when I had one of your rubber feet applied to it I at once discovered that I had bettered my condition. I have worn your rubber foot now about twenty-eight years, am a machinist, and work at the lathe and forge. For ten years I worked on a foot lathe, doing the treading with my rubber foot.

* THOS. DILLON—Newfoundland. Below elbow.

It affords me unqualified pleasure to state that, having worn one of your artificial arms, results having shown that with ordinary care in measurement, and following your instructions, one can be positively assured of a perfect fit. The rubber hand is something to be proud of. With gloves on both hands it is almost impossible for a stranger to distinguish the difference.

* JAMES DIMMICK—Plasterer, Woodward Co., Okla. Below knee.

I have used artificial legs for over twenty-nine years, and I think I ought to be a good judge. I can walk easier with your leg and rubber foot attachment than with any other leg I have ever tried,

and I have tried four different kinds. I am a plasterer by trade, and work on the scaffold every day now. It fits me better than any leg I have ever tried, and it was made from measurements.

* J. H. DINGMAN—Oil Producer, Crawford Co., Pa. Below elbow.

For the past five years I have worn two of A. A. Marks' artificial hands, one for dress, the other for working. They both have given me the best of satisfaction. I am an oil producer, and do a great deal of work about my wells. Can do nearly as much as any of my men. My left hand was amputated about three inches below the elbow. April 20, 1904.

* W. A. DIXON—Tailor, New Zealand. Above knee.

Twelve months ago I received an artificial leg from you to replace the left one, which I lost by being caught in machinery in Victoria. I had previously used a Colonial made leg, which gave me much pain, and chafed the stump if I walked any distance, but since I have used your manufacture I have had ease and comfort.

and I can walk long distances without any inconvenience. It has far surpassed my expectations. The leg was made by you from measurement, and could not be more perfect in any way. In my travels I have met many other makes, but have always heard yours spoken of as the best, and I only regret that I had not got you to make me one years previously. June 6, 1904.

* JERRY DONOHUE—Chenango Co., N. Y. Below knee.

I wish to say something in praise for the comfort I take in wearing your leg. It is all right in every way. I have now worn your artificial leg nine years. No one can tell by my walking that I have an artificial leg. It is light, and can be handled with perfect ease in any kind of work. May 23, 1904.

JAMES DOUGHERTY—Railroading, Alleghany Co., Pa.

I am working and doing better on my artificial limb than I expected to, and it is giving me much better satisfaction than I thought possible in so short a time. My business as foreman on steam shovel work compels me to walk over very rough ground, but I have experienced very little difficulty in doing so. I am certainly well pleased and satisfied. May 27, 1904.

* BETTY DOUGHTY—Vocalist, England. Below knee.

I have much pleasure in stating that I consider the artificial limbs with rubber feet, made by you, to be second to no other make

on either side of the world. My left leg was amputated when I was four years old, from which time till about four years ago I had various limbs fitted as I grew. Since wearing your limb I am able to not only go about easily and naturally, but also to appear on the stage in opera, playing Erminie, the Countess in Olivette, Dolores in Florodora, and other parts necessitating quick movement and short dress, which I wear without anyone being able to detect that I am at all lame. I shall be pleased to communicate with anyone who would like further information. April 28, 1904.

MRS. ALICE DOUGLASS—Essex Co., N. J. Below knee.
Two years ago I lost my lower limb, having it amputated below the knee, and procured one of your artificial limbs, which has given me the greatest satisfaction in every particular. Am more than pleased with it, and cheerfully recommend it to anyone desiring a limb. May 16, 1904.

* WM. DOUGLASS—Stearns Co., Minn. Below knee.
After wearing one of your artificial legs since the fall of 1893, I will state that your leg gives me more satisfaction than any other I have worn since 1865. No more ankle joints, heel cords, or instep springs for me. Your artificial leg has not cost five cents for repairs since the fall of 1893. I believe your artificial limbs are the best manufactured in the United States or any other country. I have worn six different kinds. March 2, 1905.

* JOHN DOWNEY—Engineer, Gogebic Co., Mich. Ankle amputat'n.
I am using the third artificial foot received from you. It is perfectly satisfactory in every respect. April 29, 1904.

* GEORGE DOYLE—Barber, Lewis & Clark Co., Mont. Above knee.
I wish to state the limb I received of your firm is satisfactory in all respects. As you know I have but a ten-inch stump, but there are very few people who know I have a limb off. I have seen several people here wearing limbs, but I can walk better than any. I have recommended your limb to many. April 29, 1904.

A. S. DRAPER—Commissioner Dep't. of Education, Albany, N. Y.
Two years ago I was so unfortunate as to lose my right leg at the knee, and since then you have made two artificial legs for me (the second is reserved in case of emergency that I might not be without a limb) which are giving very good satisfaction. The mechanism is ingenious, and I am able to get about with considerable facility and very comfortably, for which I am obliged to you. May 5, 1904.

* D. DRUMMOND—Farmer, Ontario. Ankle joint amputation.
Artificial limb received and fitting satisfactory, although the measurements were taken ten years ago, this one fits as well as the old one. My leg was amputated at the ankle joint in 1879, used three wooden artificial limbs with ankle-joints, but when visiting Columbian Exposition, in 1893, was measured and procured one of yours, and have no hesitation in saying that it has lasted nearly as long as the other three and given better satisfaction. I am a farmer by occupation, and can perform all the work of a farm, in fact have won prizes at plowing matches since I have had it.
May 25, 1905.

AUGUST DUDENHAUSER—Real Estate, Jefferson Co., Wash.
In regard to the artificial leg which you made for me about one and one-half years ago, I take great pleasure in saying that I prefer it to all the previous makes that I have used. I lost my leg in battle in 1864. I have worn many different kinds since, and yours is equal to the best of the others in every respect except one, and in that it is superior, I mean as to its always being ready for use without that trouble and annoyance of adjusting, oiling, regulating the ankle joint. May 12, 1904.

* THOS. DUFFETT—Newfoundland. Above knee.
In reference to the artificial leg, I am well satisfied with it. It is a great improvement over the leg I had been wearing. My occupation is in a boot and shoe factory. I sometimes have to carry considerable loads of shoe uppers, and I find no difficulty in walking. June, 1905.

M. A. DUMOND, M. D.—Ithaca, N. Y.
You can rest assured that I shall do all I can for your artificial limbs, as I consider them the best in the market. May, 1905.

W. DUNCAN, M. D.—Chatham Co., Ga.
I endorse Marks' artificial limbs with pleasure. My associate, Dr. T. I. Charlton, who rendered me very valuable assistance in taking the measurements for the last two legs ordered from A. A. Marks, also endorses them. No complaint has been made to me by any person for whom I have procured the Marks' artificial limbs, and they seem fully adapted for all that is required of them. June, 1905.

HARRY L. DUNN—R. R. Clerk, Chemung Co., N. Y. Below elbow.
In March, 1893, I met with an accident which caused my left arm to be amputated about one inch below the elbow. In June, same year, you fitted and made me an artificial arm, and since then I have worn the arm every day. It has always been satisfactory, and I find no discomfort. If I go without it only a few hours I feel out of place and miss it nearly as much as I did the original. May 18, 1903.

* WM. H. DURHAM—Bookkeeper, Windsor Co., Vt. Below knee.
Somewhat over three years ago I got, through Dr. Woodward, one of your artificial legs, and have been wearing it constantly ever since, and without one cent spent for repairs or alterations. Feb. 25, 1905.

* JAMES EARL—Laborer, New Zealand. Above knee.
To say that the artificial leg you made for me pleases me would but inadequately express my gratitude. I am a sailor by profession. and although I do not follow that occupation now, still I am able to move about freely, and do a lot of odd jobs whereby I earn an independent living. When your readers understand that my leg was amputated close to the hip, they must acknowledge the perfection of the artificial limb, which enables me to accomplish so much. I could get about naturally with it after a trial of three days. I cannot bestow too much praise on the limb and the ingenuity displayed in its construction. I hope you will long be spared to alleviate the distress and suffering of unfortunate humanity. June 15, 1904.

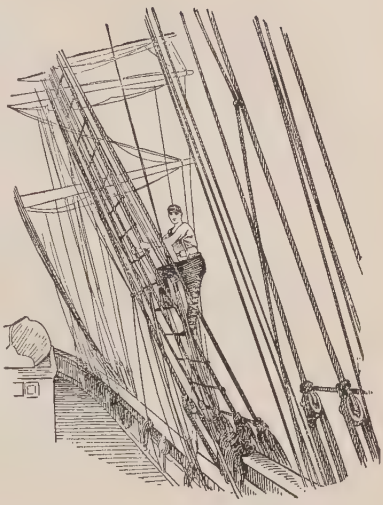
* AARON ECKER—Farmer, Carroll Co., Md. Below elbow.
I would not take double the cost for the arm you made for me, I have loaded farm wagon, plowed, and laid off corn ground. I even tie my shoes with the hook and my other hand. May 31, 1904.

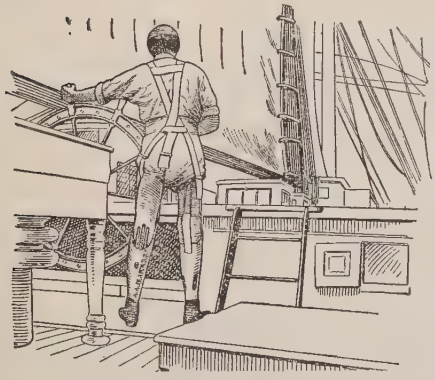
BENJAMIN EDDY—Paper Machinist, Franklin Co., Mass.
I lost my left hand two inches above the wrist in August, 1890, while at work on a paper machine. I commenced wearing one of your arms in October of the same year, which I wore and used to good advantage until October, 1903, when it became necessary for me to secure a new one, which, like the former one, is perfectly satisfactory. I consider A. A. Marks the only manufacturer of artificial limbs, so far as good results are concerned. The hook, which I attach to the fore-arm, enables me to do anything, and most everything in a quick and perfect manner. I have been employed in a paper mill ever since my accident. May 7, 1904.

WILLIAM P. EDDY—Manufacturer, Brooklyn, N. Y. Partial foot.
I wish to say that the appliance you made for me four years ago is in good condition, which proves the durability of your application to Chopart amputation. It is superior to that made by anyone else, or even made by yourself heretofore. May 31, 1904.

W. E. EDGERLY—Brooklyn, N. Y.

In October, 1897, I met with a railroad accident that deprived me of both my limbs. My right leg was amputated a few inches below the knee and my left in the knee joint. In two months after the amputation I ordered of you a pair of artificial legs. You fitted me neatly, and in a short time I was able to get about and mingle among my friends, go to my club, and engage in business. I am part owner of the bark *Obed Baxter*, and as I am very fond of the sea, I occasionally take long cruises, and have but recently returned from a cruise covering two years, which carried me around the world. I am sending you a picture of myself at the wheel, a position I frequently occupy. I also send you a picture of myself in the shrouds, taken off the coast of Japan, although I do not make a practice of going aloft, I have done so on a number of occasions, and have found very little difficulty on account of my artificial legs. I also send you a photograph of myself on horseback while in the Hawaiian Islands, near the city of Honolulu.





The artificial limbs of your manufacture are marvels. They are light, simple in construction, and thoroughly efficient. I have not had occasion to send my limbs for repairs since they were made, and from all appearances it will be a long time before any repairs will be required.

If this letter pleases you you can publish it among your testimonials when occasion arises.

* MISS MILDRED E. EDMONSON—School Girl, Australia. Instep.
About twelve months ago I got one of your aluminum legs for an instep amputation. It has given me every satisfaction. I can walk any distance, and get about as quickly as ever I did without any discomfort. June 22, 1904.

* T. S. EDWARDS—Ireland. Above knee.
The leg you made from the measurements I recently sent you fits admirably, and leaves nothing to be desired. From the first I was able to walk with comfort. The chief feature to be admired about your limb and one which, if there were no other, should be sufficient to commend the leg to all artificial limb wearers, is the noiselessness of its motions. I feel myself a new man, and the limb has turned out to my expectations, nay, far beyond. The rubber foot is a great improvement over the old articulating ankle joint.

ADAM E. EHRLIN—Car Repairer, Erie Co., O. Below knee.
I wish to inform you that I received the artificial limb you made for me in good condition, and wish to state that I consider it a fine piece of workmanship, and am well pleased with it, and am in doubt no more in regard to the ankle being a success. It exceeds my expectation, I can walk better, straighter, and have gotten rid of that squeak at last. After wearing an ordinary ankle joint limb for eighteen years, I can truthfully say yours is the best, and the fit is perfect. I feel like a new man when I walk; everything is different with your limb, and I am thankful that I went to A. A. Marks. Refer any doubtful person to me. May 29, 1904.

* REV. S. H. EISENBERG—Centre Co., Pa. Above elbow.
I have used an artificial arm made by you for fifteen years. There was no difficulty in obtaining correct size from your system of measurements. My arm is off half-way between elbow and shoulder.

STEPHEN G. ELDRED—Clerk, Oneida Co., N. Y. Below elbow.
The arm I bought of you gives very satisfactory results. It is light, and fits so well that it can be worn with ease at all times. I find it of great value in my business. June 15, 1905.

* DR. H. E. ELDRIDGE—Santa Rosa Co., Fla. Below elbow.
I will say that I am now wearing my second arm of your make. I lost my arm in 1890. It was amputated one and one-half inches below elbow, and you realize an arm to be of any service to me has got to fit. The first arm I used was of another make, and was very unsatisfactory. I am a physician in active practice. I drive a double team, dress and undress myself, and attend to all my duties as well as a man with two natural arms. My patients and friends are always complimenting me in the way I do my work. I discharge all the duties of a general practitioner, and often perform surgical operations that few men would attempt even with two hands. I will also add the fact that I have fitted several unfortunates with your limbs, all give satisfaction. April 28, 1904.

* JAMES W. ELDRIDGE—Farmer, James Co., Tenn. Above knee.
I have been wearing one of your legs for nine years, and am now wearing my second leg, and I must say without your leg I am perfectly helpless. It enables me to do anything. I ride bucking broncos, and do most anything that I want to. My leg is off above the knee. I will always be ready to speak a word of praise for "Marks'" legs. Sept. 9, 1904.

* REBECCA C. EMENHEISER—York Co., Pa. Below knee.
I am more than pleased with your artificial leg with rubber foot attached. I can walk so well that people cannot tell that I

wear an artificial leg. I have worn several with ankle joints, but would not wear them now if given to me free of cost. Aug. 11, 1904.

CONRAD EMRICH—Sexton, Borough of Queens, N. Y. Below knee.
Having used for four years an artificial leg from a well-known firm, previous to coming in contact with your firm, I can conscientiously state that your make is in every way better suited to me. With the aid of the Marks' leg I can walk and perform my ordinary work much better. I climb stairs, and ladders, dig in the garden, and do heavy lifting, and do not fear a fall or the disarrangement of the mechanism of the leg as formerly. May 13, 1904.

* H. HURLOCK EVANS—Queen Anne Co., Md. Above knee.
I take great pleasure in recommending your artificial limbs, especially for their durability and superiority, and of the excellence of the rubber foot, over all others. I only had a six-inch stump and can walk easily without a cane or crutch. Can sail my boat as well as ever. May 2, 1904.

C. EWER—Asst. Surgeon, U. S. A., Fort Sidney, Neb.
I have purchased Marks' artificial limbs for patients, and they invariably have given entire satisfaction.

* THOS. EZELL—Salesman, Jasper Co., Ga. Below knee.
I have used your artificial foot and leg continuously for eleven years, and it gives perfect satisfaction. The fit by measurements

was perfect. I had no repairs done, although I was in active business, such as a salesman in retail dry goods and grocery store, and have walked the old field, bird-hunting, for one-half day at a time. The rubber foot seems as good to-day as when first bought.

* MRS. ELIZA A. FAIRFIELD—Housewife, Missisquoi Co., Que.

I received an artificial hand from you about one year ago. My hand was taken off two and one-half inches above the wrist; unfortunately it was my right hand that I lost. Your hand was fitted from measurements at home. I am satisfied with it. I would not like to be without it. May 23, 1905.

* MRS. W. A. FAIRWEATHER—New Brunswick. Son Asa, age 8.

My son, Asa, had his leg amputated on account of typhoid fever. The amputation took place on the 18th day of April, 1901. The lad was then five years old. He walked on a crutch for about one year, at the end of which time we procured from you an artificial leg. We put the leg on immediately, and a few weeks after he walked

about without the aid of a cane or crutch. In September, 1902, he began his schooling, and has continued it to the present time.

He walks, runs, swings, jumps, plays ball, and enjoys himself as well as other boys. We were advised by many not to procure an artificial leg, as it was not supposed that he could use one, but we were afraid that the child might receive some injury from using crutches, and therefore determined to get the leg. We do not regret having done so. The results attending the case make me feel it a duty to recommend every person who has a child, no matter how young he may be, who has lost a limb, to provide the child with an artificial one of your make as soon as possible. May 23, 1904.

J. W. FARILL, M. D.—Cherokee Co., Ala.

I have experienced the worth of the A. A. Marks' artificial arm, and would say it is a perfect Godsend, and worth its weight in gold.

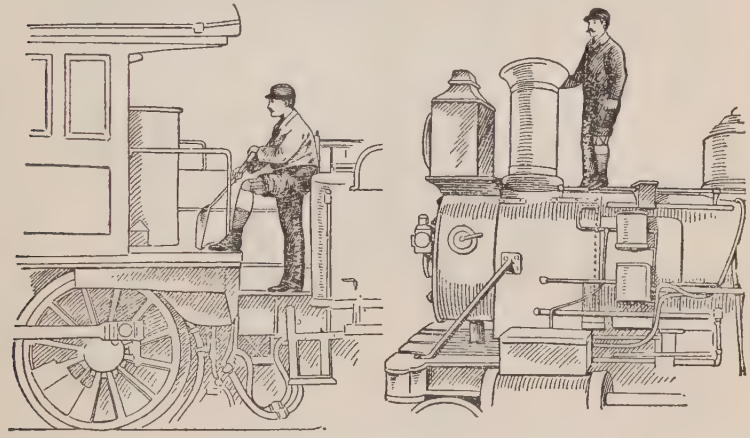
* J. C. FARLOW—Prison Guard, Randolph Co., N. C.

I have worn one of your limbs with aluminum socket for the past seven years. Think they are the best for partial foot amputation. I can get around so well that many of my acquaintances do not know that I wear an artificial limb. Although my heel was allowed to drop backwards while healing, the aluminum socket

holds it in place. I rode a bicycle seventy-five miles over rough country roads in one day. My occupation at present is prison guard on the public roads, which compels me to stand on my feet from twelve to fourteen hours every day. I have worked at house painting since I have been crippled, and I have no trouble in climbing ladders. May 23, 1904.

FRANK FAUST—Fireman, Schuylkill Co., Pa. Below knee.

I wish you to know how many days the leg you made for me worked during the year 1899. You see that it exceeds more working days of ten hours each than there are working days in the year. If you know of anybody, with an artificial leg, who has turned out more days' work than I have firing a big coal engine, remembering that I have to walk two miles to work and two miles from work, making four miles every day in addition to my work, let me know who he



is, that I may compare time with him. During the month of January I worked 407 hours; February, 292; March, 358; April, 325; May, 280; June, 316; July, 337; August, 376; September, 337; October, 391; November, 375; December, 337. . . . If you will add up the number of hours, you will find that it amounts to 4131, or more than 413 days for the year, and you know there are 313 working days in the year, so I have worked a year and one hundred days in the year 1899, wearing your artificial leg every hour of that time, and it has not cost me one cent for repairs. It is as good now as it ever was. The engine that I am firing is one of those big ones that haul coal from the mines to Pottsville, No. 148. I inclose a photograph of my engine, where you will see me at my post of duty. I get all over her with the same ease that I ever did. Sometimes I climb on top of the boiler while in motion. I can tell you more about what I am doing with my leg if you want it. The hard use I am giving your leg and the excellent wear it is giving prove it to be the best in the world. Feb. 1, 1905.

S. Y. FERGUSON—Yardmaster, Albany Co., N. Y. Below knee.

I was acting as night yardmaster when my leg was amputated. I thought, as everybody else did, that I would never be able to perform the duties of yardmaster again. I secured a Marks' leg and resumed my old position. This requires a great deal of walking, and getting on and off engines and freight cars. For nine years I have climbed on top of box cars, got on and off cars while in motion, and covered very frequently eight or nine miles in one night walking over the yard. I have worn my new leg ever since you sent it, and it is as comfortable as an old shoe. May 17, 1905.

THOS. FERNEY—Signalman, Quebec. Below knee.
I take great pleasure in recommending your artificial limbs, especially for their durability. My leg is amputated six inches

below the knee joint. I have worn one of your limbs since 1888. I am employed as signalman, and attend to my duties without the least trouble.

MORRIS FELDBERG—Sewing Machine Operator, New York City.
Your artificial limb gives me much satisfaction, and I wear it with ease and comfort. I will gladly recommend its merits to all who desire any information on this matter. May 19, 1904.

* CHARLES A. FILLMAN—Teleg'ph Operator, Montgomery Co., Pa.
On Nov. 7, 1902, I accidentally shot off four fingers of my right hand. I have worn one of your artificial hands ever since, and find it very satisfactory. I would not be without it. I am a telegraph operator, and find no difficulty in continuing my occupation with the aid of your hand. Aug. 16, 1904.

* T. F. FIPPS—Farmer, Montgomery Co., Mo. Above knee.
In July, 1903, I had my leg amputated above the knee. Being fifty years old and stiff I could not go on crutches. Three months after amputation I received a leg from you, and now I can get about very well. I could not do without it. May 2, 1904.

* EARL FISHER—Mobile Co., Ala. Below knee.
My right leg was amputated nine inches below the knee on June 25, 1903. As soon as I was able I purchased one of your artificial limbs and began wearing it. It fits perfectly. I am often asked by my most intimate friends which leg is off. I can do most anything I ever could. Your foot is simply perfect. Oct. 28, 1904.

CHAS. W. FISHER—Sangamon Co., Ill. Below knee.
Two years ago I had you put one of your rubber feet on an artificial leg made for me by another firm, which had an ankle

and toe joint. Both joints bothered me a great deal, they were all the while getting out of order. As soon as the joints would wear, they would rattle and thump. This annoyance has all disappeared since I had you apply a rubber foot to the leg. The rubber foot does not cut out the socks, as did the old style wooden foot. I also notice I do not slip so badly in winter weather as with the ankle joint foot. My limb is amputated about half way between knee and ankle, and have been using an artificial limb since 1873. I weigh 230 pounds and move about freely. April 28, 1904.

* NEWFOUNDLAND FISHERMEN remember well the cold storm that set in about the first of April, 1888. It was then that Edward and Peter Fleming, brothers and fishermen, of Forbay, met with a thrilling experience that deprived them of their legs, and nearly cost them their lives.

They were fishing off the coast of Newfoundland, when a storm drove them from their location. Twelve days they drifted about at the mercy of the cold, wind, and ocean—famished, athirst, and frozen; nothing to eat, nothing to drink, no succor, no hope. When despair and suffering had nearly exhausted them, a bark bound for Quebec picked them up, and cared for them the best they could; but their sufferings were not alleviated until they were placed in the Quebec Hospital, where it was found necessary to amputate both legs of each. In course of time Peter and Edward sent their measurements to A. A. Marks, of New York, for two pairs of artificial legs. The letter printed below tells the results.

To A. A. Marks, New York:

Dear Sir:—In regard to the artificial limbs you made for my brother Peter and myself in 1888, they are wearing well yet. They never cost me one cent for repairs since I got them. I was speaking to several men on crutches, and I told them that I had two of your limbs. They were surprised, and wished they could get the like of them. I do a great deal of walking around the ground in summer time. I cannot praise your limbs too highly, for they are a great comfort. My brother Peter is meeting with the same success.

H. J. FOLLWEILER—Bookkeeper, Lehigh Co., Pa. Below knee.

I purchased my artificial leg from you last December for an amputation below the knee. It is giving perfect satisfaction, in fact I could not do without it, it is light, strong, and well made.

I am a bookkeeper by profession, but spend much of my time on the farm, where I have to walk much.

There is very little wear and tear of your legs, and I heartily recommend them to all who are contemplating purchasing. The rubber foot and non-articulating joint give me a firm, natural, and graceful walk. May 27, 1904.

* HERBERT C. FOOTE—Fisherman, Newfoundland. Above knee.

I received the limb on the 13th of July, 1903. I am getting along well with it. I can go about anywhere almost as well as I could with my own limb. I wish you every success. May 28, 1904.

* MISS AGNES FORD—Stanislaus Co., Cal. Above knee.

I have worn your make of artificial legs for over thirteen years, and am well pleased in every respect. I purchased my first limb of you when I was only twelve years of age, and wore it twelve years, it was a great comfort to me, as it enabled me to be with my friends on the playground at school. The new limb I purchased from you a year and a half ago is doing good service. Your limbs are far superior to any other make, and I highly recommend them to any in need. July 26, 1904.

* JOS. M. FORD—Stone Cutter, Baltimore Co., Md. Below knee.

I take great pleasure in recommending your leg as the best I ever wore. Previous to wearing yours I had worn four ankle joint legs made in different parts of the country. But I never had the comfort and feeling of security I have had since wearing your rigid ankle, spring mattress, sponge rubber foot. I am a stone cutter, and my business requires me to stand among broken stone much of the time; while wearing ankle joint legs either ankle joints or toe joints were always getting out of order. All this has been done away with since wearing the rubber foot and stiff ankle. The leg I am now wearing is the second you have made me, and neither one has been any expense to me. Aside from comfort, I walk better, travel farther, and am in every way better satisfied than I ever was with any other make.

There are many that are now wearing ankle joint legs, if they only knew the comfort of the stiff ankle and rubber foot, would discard their old legs and try the rubber foot. It took me a long time to make up my mind to try it, but I never regret that I did, and never expect to wear any other kind. May 3, 1904.

* W. H. FORREST—Builder, South Africa. Below knee.

I am much pleased with your artificial leg. It is a perfect fit. I have made up my mind never to wear an ankle joint foot again. I was eighteen months a member of the Town Guard, during the Boer War, and was never off duty, when the Guard was in active service, and to this day the commanding officer is not aware that I walk on an artificial leg. The doctor who has assisted me in measuring, is so pleased with your work that he is turning all his work your way. April 12, 1904.

* T. F. FORSTER—Blacksmith, Lake Co., Colo. Above knee.

I am one of those who have to resort to artificial legs, I am thankful to say that I am well pleased with your make. My amputation is seven and a half inches from my body; applied leg March 28, 1903, and have worn it every day since. My labor is sawmill and blacksmith work. I had seventeen other firms to choose from I don't believe I could better my condition. The rubber foot is all right. May 1, 1904.

THERON C. FOWLER—Farmer, New Haven Co., Conn

I have worn one of your artificial arms for the past twelve years and could not do without it. I find it of great help in riding a bicycle, which I use in my business. I have ridden on an average

over 3,000 miles per year for the past five years. I simply place the hand on the handle-bar the same as the natural one.

April 13, 1904.

* FRED FOX—Farmer, Crawford Co., Ill. Below elbow.

I am a farmer, and am at work most of the time. I find the hook and ring you supplied with my artificial arm very useful in working around the farm. I lost my arm, three inches above the wrist, a year ago last winter in a corn shredder. May 22, 1904.

* HENRY FRANK—Chenango Co., N. Y. Daughter Helen, age 9.

My child, Helen, lost her leg when she was but two years old, we obtained her first artificial leg from you when she was a little over three years old, which she wore for a long time. We have since bought a new leg, which she is now wearing satisfactorily. We are well pleased with what you have done for her. The girl attends school, plays with other children, jumps, swings, dances, in fact, there is hardly any enjoyment that her companions engage in that she is not with them. It is hardly possible for anyone to detect that she wears an artificial leg, everybody is very much surprised at the way she gets about. I am congratulated on all sides for having provided for her in such a way when she was so young. June 13, 1904.

* J. HUGH FREEMAN—Casket Trimmer, Davidson Co., Tenn.

I am very much pleased with the artificial limb purchased from you. I follow my occupation (casket trimmer) without difficulty. My limb was amputated at lower part of thigh and the limb you sent replaces to a great extent the one I lost. Your artificial limbs are a great boon to unfortunates like myself. April 30, 1904.

* MRS. ROSELLA FOX— Both arms below elbows. Written with a rubber hand.

Lincoln Net Nov 10th 1887

Mr Marks
Dear Sir I can cheerfully recommend your artificial hands I have found them very useful money could not buy them if I could not get another pair I can go out in company and no one ever thinks of me being a cripple my hands are so natural
I write this with my artificial hands and I am preparing to take a position as writer in the Registers of Deeds office I am a widow and have to earn my living it makes me shudder to think what my life would be if it were not for your artificial hands they are truly a great blessing to those who have had the misfortune to lose their hands
I am well pleased with mine in every way wishing you success in your great work I am
Respectfully
Mrs Rosella Fox

* W. S. FREEMAN, M. D.—Nova Scotia. Above knee.
I am happy to inform you that the artificial leg you made for me works splendidly. I feel like a new man on it. This feeling is encouraged by the kindly comments of my friends. I regard the rubber foot as a great improvement.

CHARLES A. FULLER—Lawyer, Chenango Co., N. Y. Above knee.
My leg was amputated within eight inches of the body at Gettysburg. For many years I wore a leg with an ankle joint which gave me no little vexation. Whenever the spring that kept it in place weakened, the foot would drop and the leg trip, and I would lose my natural sweetness of temper. I have worn the Marks' leg for the past fourteen years, and have had no such trouble with the rubber foot. I am now wearing my second leg, and it looks as if it might do good work for the next dozen years.

I. C. GABLE, M. D.—York Co., Pa.

I have recommended the A. A. Marks' very valuable patent artificial limbs to a number of my patients, who are wearing them with perfect satisfaction, and I have no hesitancy in saying in my judgment they fulfill their purpose better than any others that have come under my observation.

MISS GRACE GALE—Belknap Co., N. H. Shortened leg.

I procured an appliance similar to that illustrated in Cut K 11 of your manual. I have worn the same now for nearly a year, and it has given me a great amount of comfort and relief. I walk much better, and have never used a crutch since wearing it, and it keeps my ankle firm. I recommend your work. June 2, 1904.

* MISS MARY A. GALLAGHER—Tuscaloosa Co., Ala. Below knee.

I am wearing the second artificial supplied by you. I get along without any assistance; lost limb six or seven inches below the knee in 1886, bought one of your manufacture in 1887, have used constantly ever since, and at the present I am wearing the second, bought in 1903. I would never be without one. It is the talk of all my friends how active I am with it. May 14, 1904.

J. B. GAMBLE, M. D.—McDonough Co., Ill.

The endorsement of patent articles, of whatsoever kind and description, is something I very seldom do, but the Marks' artificial limbs with rubber hands and feet meet my unqualified approval, as being the *best* I have ever had occasion to recommend to those desiring artificial limbs.

REV. RUFUS P. GARDNER—Merrimack Co., N. H. Below knee.

It gives great pleasure to assure you that the apparatus made by you in 1876 has answered my expectations, enabling me to walk in a natural manner and leave the crutch.

My parish work calls for a great deal of walking, which I can do with great ease. Hoping many others may find, as I have, the value of your great work.

H. R. GARNER, M. D.—Lewis Co., Wash.

I am pleased to add that the leg I procured from A. A. Marks for my patient works to perfection. He does anything that is to be done on a farm, and has lately learned to dance.

* C. H. GASQUE—Telegraph Operator, Hampton Co., S. C.

In 1891 I bought a leg from you and wore it every day for ten years. Then I purchased another, and liked it even better than the first. The last one I got has been in daily use for more than two years. I am greatly pleased with your make of limb. May 8, 1904.

R. A. GAULT—Locomotive Engineer, Otsego Co., N. Y. Below knee.

September 28, 1897, my right leg was amputated at the middle third, below the knee. I am a locomotive engineer, and in just six months from that day I was back on the road at work. I have worn your artificial limb for over six years, and have never had a spot as large as the head of a pin on my limb caused by chafing. I have stood on the engine beside the boiler with the heat at one hundred ten, and it did not affect the leg at all. I have tested it in every way. I can climb around the engine as well as I could with my own limb, can run and jump, and my weight is two hundred and twenty-five pounds. May 16, 1904.

HENRY P. GEIB, M. D.—Fairfield Co., Conn.

The persons to whom Marks has furnished artificial appliances for amputations of the feet (one Symes' and the other Pirogoff's operations) express themselves as being perfectly satisfied.

The appliances are light, easily applied, and do not produce excoriation or tenderness at the end of the stump.

I consider that Marks' appliances fulfill all the indications called for in providing artificial support after amputations.

HARRY GEITNER—Lancaster Co., Pa. Above knee.
I find the artificial leg which you furnished me entirely satisfactory. Although I have not had it a very great length of time, it is all that I could expect. I am going to school, and walk there twice a day, it is a distance of a good mile from my home.
May 18, 1894.

A. H. GIBBS—Clerk, Washington, D. C. Above knee.
The artificial leg you made for me has given me great satisfaction, especially the rubber foot. You gave me a perfect fit, and I have experienced no difficulty in wearing the leg from the first day I received it, can walk quite a distance with ease and this I consider doing well as my amputation leaves only four inches of stump from the hip. My leg was amputated in 1888 as the result of a gunshot wound received at Antietam in 1862. I attempted to wear a leg of another make but was unable to do so and after about one and a half years abandoned it and returned to crutches, which I used until I got the leg you made. I would not change back to crutches under any consideration. June 3, 1904.

* JAMES T. GIBSON, M. D.—Highland Co., Ohio.
On the fifteenth day of October I took the measurements for B, F. Puckett, Jr., for an artificial hand and part forearm. He has submitted it to-day for my inspection. The fit is perfect. Could not have been better had you had him at your place of business to fit personally.

* E. W. GILBERT—Clerk, Hamilton Co., Tenn. Partial foot.
Since December, 1902, to the present I have been wearing the artificial foot which you fitted from measurements and cast, with flattering success and I now have no tiring feeling whatever. I hope this may influence others. June 27, 1904.

* PATRICK J. GILLON—Laborer, Rensselaer Co., N. Y. Below knee.
I am getting along first rate with my artificial leg and am walking several miles a day without trouble or fatigue. May 17, 1904.

* GEORGE H. GIPE—Valley Co., Neb. Above knee.
I received my leg about one year ago and have been wearing it ever since. I could not ask for a better fit, it has not hurt me from the first. The A. A. Marks' leg is as close to the natural leg as possible. May 17, 1904.

C. H. GLIDDEN, M. D.—Herkimer Co., N. Y.
The arm you made for Mr. Lambert, under my order, has been received. To say that the arm is a great invention is to express it very mildly. It is worth its weight in gold to any man in such affliction.

THEODORE GOBLE—Signalman, Suffolk Co., Mass. Below knee.
I have worn one of your artificial legs with rubber foot for over three years, and it has given complete satisfaction. I would not exchange it for any other make. I have worn it constantly since I got it. My work is in a railroad signal tower throwing levers. I work twelve hours a day. May 26, 1904.

* CARLOS GOMEZ—Havana, Cuba. Above knee.
On the 12th inst. I received a package containing the artificial leg I ordered from you, for which I sent measurements taken at my home. I was agreeably surprised to find that the leg fitted perfectly, and can suggest no alterations that could possibly improve it. The rubber foot is perfection, I doubt very much that there can be anything better.—Translated from Spanish.
May 16, 1905.

* HENRY GOMPERTZ—Agent, Holland. Below knee.

The leg you made for me in November, 1895, is now in good use. It has scarcely required any repairs during the last nine years. I walk every day a couple of hours. A couple of years ago I was nearly drowned, the leg stood the water test perfectly, save a little rust to the metal parts, the wood was not injured by its long bath. May 2, 1904.

* JAS. W. GOOCH—Farmer, Hamilton Co., Tex. Partial foot.

Last May, while engaged as a locomotive fireman on the G. C. & S. F. R'y., I met with the misfortune of getting the front of my left foot badly crushed. I wore a shoe stuffed with cotton for some two or three months, this was very uncomfortable, as well as awkward. In the meantime I came in contact with a doctor who was well acquainted with your limbs, and from the satisfaction he had in dealing with them, I concluded to order one, and did so at once. I have been wearing the limb for several months, and am well pleased with it. It fits perfectly, is not conspicuous, and is very much more comfortable than a shoe stuffed with cotton. With the aid of this limb I can do any kind of work I wish to. I am at present a farmer, and I walk and follow a plow nearly as well as I ever did. A person not knowing I had lost part of my foot would not detect it in my walk.

If, when a foot or a leg has been amputated, and it can be replaced by one not made by nature, and do the work nature intended it should do, I say it is perfect, and no more can be done or expected of it. May 16, 1904.

* WILLIAM GRANT—Engineer, Choctaw Nation, Indian Territory.

I am well pleased with the leg I got from you. I am working

every day as I am an engineer by occupation. I am standing on it steady from eight to ten hours, and most of the time firing. My stump is about five and a half inches long. April 27, 1904.

* JOHN GORDINE—Carman, New Zealand. Above elbow.

I am perfectly satisfied with the artificial left arm that you made for me, and surprised that you made such a useful limb. You have never seen me, or the small portion of my arm left close to the shoulder. When the arm arrived, I put it on, and have been working with it ever since, and found it extremely useful and comfortable in my work as carman and storeman, and I can haul bales of wool, sacks of coal, potatoes, etc., about as well as if I was not minus my natural arm. I have now worn it nearly twelve months.

THOMAS GORMAN—Clerk, Westchester Co., N. Y.

I am pleased to tell you that my artificial legs are perfect in every respect, and a great success. I walk about, go on cars, work in the store all day, wait on customers, tie up packages, and all the work required of an able-bodied man. I cheerfully recommend your rubber foot. I do not in any way consider myself incapacitated on account of the loss of my legs. May 17, 1904.

* HARRY GOUKER—Frederick Co., Md. Above knee.

I am well pleased with my artificial limb. In the short time I am wearing it I am perfectly satisfied with it. I would not part with it. My amputation is above the knee-joint, and I can get around as fast as my fellow boys. May 18, 1904.

CHARLES W. GOULD—Lock Tender, Albany Co., N. Y.

I write you these few lines to let you know that I am very much pleased with the leg. My occupation is lock-tending on the Erie Canal, and I get around just as good as anyone that has two good legs. I have been wearing your leg about seven years. May 16, 1904.

G. W. GRAHAM—Soldier, Sanborn Co., S. Dak. Knee bearing.

I lost my right leg by gunshot wound received in the battle of Nashville, Tenn., in 1864. I was then 22 years of age. The leg was so badly shattered that it had to be amputated very close to the knee-joint, which left me a stump that I could bend and take weight on the knee. Immediately after my injury the U. S. Government furnished me with an artificial leg, made with a wooden foot moving at the ankle. I wore the leg but a short time.

In 1871 my attention was called to your improvements, particularly the rubber foot. I obtained one immediately, it served me a great length of time, and was very satisfactory. I have since obtained renewals from you. The last I procured was on Dec. 12, 1902. I have worn it since, and can assure you it is the best leg I ever had. I cannot imagine that any other improvements can be made. I walk great distances, and get fatigued no sooner on my amputated side than on the other. No inducement could get me to try any other kind than your leg. April 24, 1904.

MRS. JOHN F. GRAHAM—Worcester Co., Mass. Below knee.

I find pleasure in sending you this testimonial. My foot is amputated four inches above the ankle. I went on crutches for two years, then I purchased one of your artificial limbs. I do my own housework, and walk from five to six miles every Sunday through the country. I danced at a lawn party given by my friends six months after receiving your limb, two years ago. June 19, 1904.

* JOHN N. GRAHAM—Mechanic, Grand Traverse Co., Mich.

The artificial leg I got of you is giving good satisfaction. I have never gone a day without the leg since I got it, and am doing work around a sawmill all the time. May 23, 1904.

R. B. GRANGER, M. D.—New York.

I know of no artificial appliance that so nearly simulates nature as those of your manufacture.

* THOMAS GRANT—Telephone Operator, New Zealand. Wrist.

I can manage all the work in the post and telephone office. I manage very well in tying up the mail bags, I hold the receiver of the telephone in the rubber hand and take off messages with the other. June 7, 1904.

* J. D. GRAY—Saw Filer, Hillsboro Co., N. H. Below elbow.

I have worn a hand of your make for more than ten years, and could not get along without it. I am a saw filer, and work every

day. My hand is amputated about half way between the elbow and wrist. May 7, 1904.

* C. E. GRAVES—Clinton Co., Ind. Partial hand.

I am employed as a life insurance solicitor and collector. The four fingers of my right hand were amputated, leaving the thumb with very little support. However I find that I am able to handle books and papers to a much greater extent by the aid of the artificial hand than I could without it. It restores the hand to almost its natural appearance, which is a great advantage in dealing with the public. I have had two of these artificial hands made. While no artificial attachment can be made equal to nature's, yet the hand I have is a great assistance, and could not well be dispensed with. May 16, 1904.

BELLE T. GRAY—Bristol Co., Mass. Shortened leg.

I have worn the foot steadily for over eight years, and don't think it can be improved. I feel very grateful that you and your workmen have been gifted with the spirit of wisdom to know what would suit me so well.

* MRS. EMMA C. W. GRAY—Richmond Co., Ga. Daughter, age 13.

I am very well pleased with the limb made for my little girl. The girl used crutches before getting the limb. She now walks like other persons, goes all about, and suffers no inconvenience whatever. June 15, 1904.

PETER GREELEY—Ranchman, Holt Co., Neb. Below knee.
I have worn artificial legs of your manufacture continuously since the summer of 1888, I lost my limb at Peach Tree Creek, Ga., in 1864. Before trying your make I wore limbs of various kinds, with all of which I had more or less trouble with the ankle-joint, but your leg having no ankle-joint, but a rubber foot, has given me no trouble whatever. Being the proprietor of a ranch, most of my working hours are spent on my feet or on horseback, thus submitting my limb to a severe test. I shoot quail and prairie chickens with the boys, and usually secure a fair share of the birds. In brief, I consider your artificial leg the easiest, and most durable of any I know anything about. May 12, 1904.

DAVID GREEN—Driver, Suffolk Co., N. Y. Knee bearing.
My left leg was amputated just below the knee on September 14, 1903, and on March 25, 1904, I was fitted by you personally with an artificial leg, which has given me splendid satisfaction, and I am now able to walk without crutch or cane. May 10, 1904.

* CAPT. T. M. GRIFFIN—Farmer, Hinds Co., Miss. Below knee.
About one year ago I had my left leg amputated four inches above the ankle, four months after I applied for an artificial leg with rubber foot of your construction. I have been wearing the leg ever since. I would not be without it for any consideration. I am a farmer, and can do nearly everything a man of my age (79) ought to be expected to do. May 7, 1904.

WILLIAM GRIFFIN—Washington, D. C. Above knee.
With reference to the artificial leg you furnished me two years ago, I take great pleasure in saying that of all the limbs that I have worn during the last forty years, it is the best and most satisfactory in every way. Every limb I have gotten from you is better than the previous one, this shows that you are progressing. The former leg made by you was worn uninterruptedly for twenty-two years. As you know I am employed by the Government, and my home is about a half mile from my place of occupation. But I walk to and from the latter all the year round with entire ease and comfort. I have repeatedly walked out in the suburbs of the city for miles, sometimes up and down hills without any difficulty. May 9, 1904.

* CLAUDE GRIMIT—Farmer, Cullman Co., Ala. Knee bearing.
I am 81 years old. I walk three miles at a time. This is pretty good for a man of my years using a knee bearing leg. I have had no occasion to have it repaired yet, it is now three years since it was made. I would not give my artificial leg for a cart load of crutches or peg legs either. There is nothing on the face of the earth more valuable than A. A. Marks' artificial legs. My life was a misery before I got one. May 17, 1904.

* CHARLES H. GROVES—Harness Maker, Columbia Co., N. Y.
I shall wear your legs as long as I can get them, as the legs have always fitted and worn well. I lost my leg in the Civil War, and have worn your make since 1870. May 6, 1904.

ENRIQUE GUASP DE PERIS—Mexico. Above knee.
I can assure you to-day that in this world nobody could construct an apparatus such as yours, which is so useful, so easy to wear, and so perfect that it bears a great resemblance to the natural ones. Consequently I do not feel surprised to hear that they have always obtained the first prizes when presented in the exhibitions, as they only reveal justice and veneration to the acknowledged merit of your limbs. Therefore, I heartily congratulate you, and remain once more your faithful friend—Translated from Spanish.

JAMES E. HADLEY—Carpenter, Norfolk Co., Mass. Below knee.

My leg was amputated April 16, 1902. I returned to my work just eleven weeks after the amputation, I walk without a crutch or cane. I am employed by the N. Y., N. H., H. R. R., as a wood machinist. I can get about as well as any man in the shop, and do as much work as ever I could. I would recommend your leg to anyone needing the same. May 10, 1904.

* ALEX HAGEMAN—Blacksmith, Watauga Co., N. C. Below knee.

On the 11th day of August, 1879, I had the misfortune to lose my left leg below the knee. I went on crutches eighteen months, then I made, with my own hands, a wooden leg, and wore it about twenty-two years with much pain and difficulty. In 1890 I procured one of A. A. Marks' manufacture, on which I have been walking with comfort. I would not do without it for twice what it cost. My occupation is blacksmithing. I also do some farm labor and get about with ease. May 25, 1904.

* L. H. HARKEY—Stock Farmer, Choctaw Nation, I. T. Wrist.

About four years ago I lost my right hand at the wrist joint. In about three months I ordered an artificial hand from you, which I have been wearing ever since. It has given me the best of satisfaction. Has never hurt me. I could not get along without

it. I do most of my writing with it. I am a stock farmer, I hold my coil in my artificial hand and throw the loop of my rope with my natural one. Could not praise my artificial hand too highly. This letter was written with it. May 3, 1904.

* JAMES HALL—Colfax Co., Nev. Above knee.

The limb I got of you last year is quite satisfactory. I have worn six different makes of limbs, and yours has given me the best satisfaction of all. May 21, 1904.

JOSHUA HALL—Railroad, Monmouth Co., N. J. Below knee.

I am working every day at the round house, taking care of the railroad engines, and my work is the same as other men's, and

you can judge from that how I am getting along. I had the misfortune of losing my leg in 1901, below the knee, and in 1902 commenced to wear one of your make. I can recommend your leg to anyone. May 7, 1904.

* W. E. HALL—Grocery, Shelby Co., Tenn. Below knee.
I am well pleased with my new leg, it fits all O. K. I have worn your make of artificial limbs since 1892, and in all my rounds have never seen anybody get along as well as I do. I can do anything, go as far as anybody. Am in the retail grocery business. I stand all day without sitting down, and it takes a good walker to keep up with me. May 12, 1904.

* EARL O. HANDY—Engineer, Montgomery Co., N. Y. Above knee.
My leg works all right. I learned to walk on it in two weeks. Would not go on crutches under any consideration. May 9, 1904.

* J. W. HANKINS—Stenographer, Jones Co., Miss. Below knee.
You will probably remember that this is the second limb you have made for me, and the fact that I have placed a second order with your concern is proof that I am well pleased with the limb you are placing in the market. Notwithstanding the fact that my stump is only 8¾ inches long, I walk rapidly, more so than many people with natural limbs, and most of the time without the aid of a cane. The new limb, as well as the old, is a perfect fit, and you will note, by referring to my orders, that measurements for both limbs were taken here. May 31, 1904.

JOHN HARMON—Coremaker, Cayuga Co., N. Y. Below knee.
I got my second Marks' leg April, 1903. I had been wearing one for seven years. Never had any trouble with it. My limb is off below the knee. When I received my second leg, I laid the old one aside, put on the new one, and have never taken it off except at night. I have looked up all other manufacturers of artificial limbs, and I can safely say that the Marks' leg is the only one that can be worn with solid comfort. It is hard to tell a Marks' leg, going along the street, from the natural. May 11, 1904.

* JAMES HARRAP—Draper, New Zealand. Knee amputation.
Between four and five years ago you made an artificial leg from measurements sent to you. It has given me every satisfaction, in fact I have worn it ever since, and could not wish for anything better. April 29, 1904.

* JOHN HARRIS—Messenger, Norfolk Co., Va. Below knee.
It affords me much pleasure to let you know that the leg I bought from you I am getting along very well with. I am wearing it every day, and can walk very well with it. May 5, 1904.

* O. GEO. HARVEY—South Africa. Ankle joint.
During the latter months of 1898 I ordered of you an artificial foot to fit a Symes' operation. The limb has given me the greatest satisfaction, so much so that I have determined to have another in case of accident to the first. The artificial leg was perfect, and in my case has done away with the pain caused by a misfitting, cumbersome one of the other make. Jan. 12, 1905.

* HERMAN S. HASTINGS—Clerk, Worcester Co., Mass. Above knee.
When a boy of sixteen years I measured myself at home and bought one of Marks' artificial legs with rubber foot, amputation 4½ inches from the hip. I wore that leg for fifteen years continuously. The repairs, including the expense of lengthening, was a matter of only a few dollars. The leg, in my younger days, was given very hard usage in teaming, lugging, lifting, etc. Still having confidence in Marks' limbs, I bought another, with improvements, in 1903. My position now being a clerical one I am not so hard

on my limb, and expect it to last as long as the former one. I desire to say further, that from the fact of having the artificial limb I obtained several prominent positions, which otherwise would have never been opened to me. May 7, 1904.

* JOSEPH A. HATCHER—Miner, Newton Co., Mo. Below knee.

I am wearing one of your artificial legs, and it has proved satisfactory. I got it the 8th of March, 1903. My leg is off three inches below the knee. I walk without a cane, and I have never had to lay it aside on account of my stump being chafed. May 16, 1904.

* GEO. W. HART—Farmer, La Grange Co., Ind. Below knee.

I can recommend your artificial leg as the easiest of any that are made. I lost my leg in the Civil War, in 1863, and have worn a great many different kinds since then, but yours, with rubber foot,

gives me the greatest comfort and best results. I am a farmer, and have a great deal of walking, heavy work, lifting, to do, and I do it all without any difficulty. April 27, 1904.

LOUIS HAUCK, JR.—Butcher, New York City. Partial foot.

I wish to express the extreme satisfaction I've had in wearing one of your artificial limbs. I've worn it now for the last ten years, and through the hardest kind of work. I am in the butcher business, and must be on my feet all day, and sometimes carry heavy weights. I enjoy dancing very much. Among my friends there are but few who know I wear an artificial leg. This is the highest tribute that can be paid to the highly satisfactory article you turn out. May 18, 1904.

* ANDREW HAUGHN—Farmer, Lunenberg Co., Nova Scotia.

In 1899 I had the misfortune of having my right foot amputated at the instep. I am well pleased with your artificial foot. It fits perfect, my walk is natural. My occupation is farming. I can get around the same as before. May 10, 1904.

* G. L. HAUBERT—Engineer, Juniata Co., Pa. Below elbow.

I have worn one of your artificial arms for over two years, and I have never had any trouble whatever with it. I run a steam

thresher, and can get along almost as well as before. I can say to anyone in need of an artificial limb, that he will find A. A. Marks a comfort giver. May 5, 1904.

E. M. HAUGHNEY—Storekeeper, Northumberland Co., Pa.

My leg was amputated three and one-half inches below the knee thirty years ago. I am a proprietor of a shoe store, and work from seven o'clock in the morning until ten in the evening. I have worn many different kinds of legs in those thirty years, but none suit me as well as the A. A. Marks' rigid ankle leg. June 7, 1904.

W. C. HAWKINS—Snohomish Co., Wash. Below knee.

Your patent foot has made me a sound man. I have had six legs with wooden feet, in the past twenty-three years, and often tell my wife that I was crazy, wearing them so long. I could not lift nor run on them, since I have yours I can plow, and take a hand at almost anything. The wooden foot made lots of noise, but your leg is quiet. The man that made my old wooden foot told me (to keep from buying your leg) that it did not give any satisfaction, and would make the stump sore, which I found to be untrue. I believe, and in fact I know, your leg to be the best on the market. I would not have any other kind as a gift. May 13, 1904.

* MRS. STANLEY HEATH—Housework, Aroostook Co., Me.

I am wearing one of your artificial legs with much comfort, I would not, or could not, get along without it. I have not had to use my crutches or cane since I got the limb. I thank you very much for your interest in me. May 12, 1904.

* G. HEINEMAN—Denmark. Above knee.

When thirteen years old I lost my right leg, and used a common wooden leg till I reached forty-four years. By this time my atten-

tion was called to your artificial legs with rubber feet. I sent you my measure, and got a leg from you, which I have used ever since, now for about six years. I am very well satisfied with it. It fits me admirably, and has required no repairs worth mentioning. The new suspenders are a real improvement. The stump, though only one and seven-eighths inches, has never been sore.

* F. HEITZ—Germany. Above knee.

Your leg satisfies me as well as an artificial limb can possibly do. It is very much lighter than the legs which I used formerly, and surpasses them also in carefulness and simplicity of construction. I thank you for the comfort which your ingenuity has procured for me. I beg you to accept my sincere salutations.—Translated from German.

The Hon. D. B. Henderson, Speaker of the House of Representatives, after having had his leg re-amputated at the knee joint, investigated in the most thorough manner the methods of the limb manufacturers in all the large cities, and found that there was but one that could satisfy his needs.

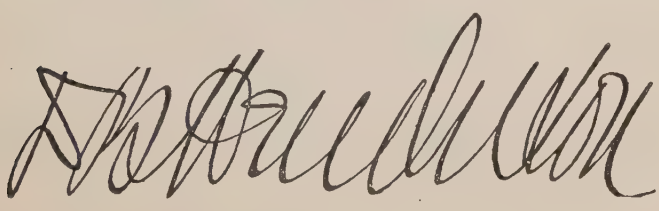
Read the following letter addressed to a Western correspondent:

Speaker's Room,
House of Representatives,
Washington, D. C.

To H. M., Esq., Nov. 10, 1900.

My Dear Sir:—The leg I wear was made by A. A. Marks. Amputations at or above the knee need better care in the matter of legs than those amputated below the knee. It takes more wisdom and experience to make legs for the former than the latter. For years I had a stump running down to within eight inches of the ankle, but about three years ago I had to have it amputated at the knee. I tried many leg-makers and found none who could make a leg for me without taking a part of the weight on the end of the stump. Chicago utterly failed me in that direction. The moment I exhibited my stump to Mr. Marks, he told me that weight could not be taken on the end of the stump, and this before I told him of my experience in Chicago. I gave him an order at once, and his work has given me splendid satisfaction. I think they have better facilities for treating all kinds of amputations than any other leg-maker in the country.

Very respectfully,



I. L. HELM, M. D.—Fayette Co., Ky.

I have ordered several of your artificial legs. They have all given satisfaction.

N. M. HEMENWAY—Farmer, Kennebec Co., Me. Below knee.

It is about two years since I received this second artificial leg from you. I have to say I am fully as well pleased with this as I was with the first one. I have worn legs made by four other makers, but as I told you at your office, I could not wear any of them, and any unfortunate cripple that once tries one with rubber foot will never wear any other. Your method of fitting stumps cannot be beat, I find all parts of the leg are substantially made, these make good reasons why I must, at every opportunity, recommend the Marks' leg. May 14, 1904.

* JAMES HENDREN—Fireman, New Zealand. Below knee.

I am getting on first class with the leg you made for me. In fact, I never think of it. I treat it the same as a natural one. I am firing on a locomotive, and I have passed my examination for driving. The longer I wear the leg the better I like it. I can ride a horse, or bicycle, as well as ever I could. May 30, 1904.

* TYSON HENDRICKS—Farmer, Bucks Co., Pa. Below elbow.

It affords me great pleasure to add my testimonial to the great number you already have. When I lost my arm I felt the importance of getting an artificial one and wearing it. After careful investigation, I decided that your make was the most practical, and I placed my order with you. I have since been convinced that I made no mistake. Your arm has served me satisfactorily for many years, and I recommend your work most heartily. May 4, 1904.

* PAUL A. HENSEL—Sawmill, Prince Edward Co., Va.

A little over eighteen years ago I was run over by a horse car, and lost my right leg above the knee, which left me a stump of

about six inches. At the time of the accident I was a boy, six years old, and for the first four years I had to wear a peg leg. After that I got a leg from you. I have been working at a sawmill, and can do most anything in that line, I can haul logs from the

woods, load and unload them, I can ride horseback as good as anyone, and when hunting season commences, I go and walk around through woods and over fields. The new leg I got from you a few months ago is all O. K., and does not give me any trouble at all. I can go anywhere I want to with it, and wear it from early in the morning till late at night. May 19, 1904.

* FRANCIS HERCKENRATH—Holland. Above knee.

I take much pleasure in certifying that the two legs you furnished me from measurements, give me great satisfaction in every respect. I have never seen legs of better construction, and I do not believe that any other kind would need less repair. The rubber foot, and the knee-joint, are far superior to all others I ever saw; hence, I can strongly recommend your highly respectable firm to all others. I lost my left leg in the year 1872.

* WILH. HERLTH—Manufacturer, Germany. Above knee.

I wish to inform you that the artificial limbs furnished by you, up to the present, have turned out to my greatest satisfaction. I have previously also ordered limbs from several first class firms, the execution of which, however, left something to be desired. I can therefore recommend your manufactory very highly.—Translated from German. Dec. 12, 1904.

* WILLIAM HERMANN—Farmer, Bates Co., Mo. Below elbow.

I will try to write you a few lines to let you know that I am well pleased with the hand and tools. I am a farmer, and can

do most any work with my artificial hand. I could not do without the artificial arm at all. I have worn it two years. I am writing this letter with the rubber hand. April 26, 1904.

* DOLORES HERNANDEZ de LAUREIRO—Cuba. Knee joint.

I thought after my amputation that I should not be able to walk except with the aid of crutches, which would make it impossible to attend to my household work. Thanks to your invention it has been so, as to-day I can do all my work and attend to my children. I walk well with the artificial leg. Persons who do not know anything about my misfortune are astonished when told that my right leg is artificial.—Translated from Spanish. June 1, 1904.

JACOB F. HERTZOG—Farmer, Berks Co., Pa.

I have a resection of the right arm, caused by a wound. I have thus far used five of your apparatus for the same, and each one gave ease and comfort, and entire satisfaction. I had two apparatus from different parties before I used yours, but they were not as easy nor as comfortable. I am a farmer by occupation, and with the use of your apparatus I am able to do all kinds of ordinary farm work. May 9, 1904.

* MRS. MAGGIE HESEMAN—Housewife, Marion Co., Ore.

The artificial limb which I purchased of you some time ago, is very satisfactory, it is the second one I have bought of your firm. My foot is amputated below the knee, and I was fitted out with a comfortable, durable, and neat looking artificial limb, which made me happier than I ever expected to be. I am a farmer's wife now, have two children, do all my own housework, raise poultry, and walk, ride horseback, or do anything that a sound bodied person can do. May 5, 1904.

E. B. HIGGINBOTHAM—Tax Collector, Elbert Co., Ga.

I think that a few words from me are due you. The pair of artificial legs you sent me in 1893 have done me good service up to the present time, and bid fair to wear well for two or three years longer. All repairs have not cost me $5.00. May 19, 1905.

THOS. HIGHAM—Oneida Co., N. Y. Below knee.

The foot I got of you six weeks ago is giving the best of satisfaction. I have worn it steady, and it don't make my leg the least sore. I surprise everybody the way I walk. I don't think I could have got as good a fit anywhere else. Oct. 6, 1904.

* CAPT. A. V. HILL—Barbados. Below knee.

I am wearing the leg you made for me constantly, and it is comfortable for all purposes. It is the third leg I have had, and it bids fair to be the most durable, and the mechanism is the simplest of the three. I think it is wonderful that you can make so well a fitting leg without personal fittings. May 20, 1904.

* JOSEPH HINKS—Engineer, Schuylkill Co., Pa Below knee.

The leg I purchased of you over seventeen years ago continues to give entire satisfaction. It is almost as good to-day as when I bought it. The change of the old style of rubber foot for a fiber spring mattress foot, is a decided improvement. I am wearing it now, and am delighted with it. It is very easy to walk on, and I believe my walking is better, as there seems to be more strength and support in the spring from the toes. April 20, 1904.

* L. HINMAN—Farmer, Gage Co., Neb. Below knee.

I always recommend your limbs, and have told a great many persons that your rubber foot is better than any other kind. I would be an expense on the public if it were not for the leg that you made for me. When five years of age my foot was cut off with a mowing machine. At sixteen I was supplied with an artificial leg, and have been wearing one ever since. I am now forty-two, and do farming for a living. I started with eighty acres, I now have another eighty, I have bought this by my own and my wife's work. I certainly could not have done it without a good artificial limb. I consider the rubber foot the only foot for constant and hard use. I have no use for the slip-socket leg, it choked my stump when I wore one, and caused me much trouble. May 13, 1904.

* O. K. HINTON—Furnace Man, Colbert Co., Ala. Below knee.

I received one of your artificial legs in May, 1898, and wore it with ease for five years. In 1903 had my measurements taken after my stump had assumed a permanent size, and ordered a second leg, which is giving me entire satisfaction. I work at a blast iron furnace, and take charge of a pumping station. April 12, 1904.

MRS. J. K. HOBBIE—Housewife, Delaware Co., N. Y. Below knee.
Words cannot express the gratitude I feel to you for what you have done for me and other cripples. You have made us all forget our afflictions. I have been wearing one of your artificial legs one and a half years. I can do my housework, and get around nearly as well as I ever could before my leg was amputated. I have a stump three inches below the knee. The artificial leg is perfect. May 14, 1904.

* JOHN T. HOFFMAN—Farmer, Jackson Co., Ia. Partial hand.
The artificial hand you sent me about two years ago is giving me good satisfaction. I would not do without it. May 14, 1904.

* ROY HOLT—Clerk, Creek Nation, I. T. Ankle joint.
In regard to the leg I purchased from you, I must say that I am very well pleased with it, I put it on the day I received it,

and have worn it constantly ever since. I cannot say enough in praise of it, I run, jump, climb trees, and participate in all the sports of the season, and am at no inconvenience. May 4, 1904.

* T. E. HOLDEN—Farmer, Buffalo Co., Wis. Below knee.
I have worn artificial legs for sixteen years, my limb is amputated six inches below the knee.
The first leg I got had an ankle joint, I will not have another of that kind unless I want an artificial leg and music box combined, the ankle joint breaks down so often that you have to watch every step you take.
The first leg I got of you was in 1893. It is still in good condition. I am hard on artificial legs, as I am a hard worker on the farm.
I ordered another leg of you in December, 1903, and I received it five months ago. It is giving me great satisfaction in every respect. I believe your make of artificial legs is far superior to any other, because of the ease, elasticity, durability, and noiselessness. These are obtained by the use of the rubber foot. May 11, 1904.

* GEO. A. HOLLAND—Bookkeeper, Quebec. Above knee.

In regard to your artificial limb, I wish to say that after 25 years experience, I believe yours to be the most desirable and the nearest approach to the natural limb.

During the long time I have worn artificial limbs I have had a good opportunity to learn just what was required. About seven or eight years ago I was looking around for some means of discarding the articulating ankle, when I learned of your rubber feet, and it at once appealed to me as filling a long felt want, and seven years ago I procured one, and have used it nearly all the time since, with perfect satisfaction.

Your limb has not cost a cent for repairs during all these years, whereas the other ones were constantly needing repairs, it has proved to be the most economical in the end, to say nothing of its greater comfort and security. Jan. 29, 1905.

* R. H. HOLLAND—Logger, Somers Co., Va. Below knee.

I can say that the artificial leg you made for me a year ago has given entire satisfaction. I wear it at least fifteen hours every day, and have been logging most of the time. Anyone that ever was in the timber country knows how hard that work must be on the legs. I recommend your legs for strength, good fit, and general relief. Aug. 20, 1904.

* T. H. C. HOMERSHAM—Engineer, England. Below knee.

I have very great pleasure in saying that the two artificial legs with which you have supplied me, have been in every respect most satisfactory. As you know, with these legs, I find myself only very slightly handicapped, and I attribute this in a very large measure to the excellence of the limbs with which you have supplied me, and especially to the simple, and sensible, flexible rubber foot which obviates the necessity of an extra and troublesome articulating joint at the ankle. May 19, 1904.

C. E. HORTON—Trader, Wyoming Co., Pa. Above knee.

Your limb is a dandy. I can use it like a dandy. My stump is only four inches from the body. I walk without a cane better than I could with the stiff knee I had before my leg was amputated. May 28, 1904.

H. R. HOSFORD—Farmer, Columbia Co., N. Y. Below knee.

I am a farmer, which has always been my principal business. For the past thirty-three years, or more, I have worn the rubber foot constantly. The elasticity of the rubber foot no doubt added much to its durability, and at the same time gave a more natural movement in walking, obviating the disagreeable thumping that attended the other foot I had used, and at the same time the jar to the natural limb, making it more comfortable and easy.

Dec. 5, 1904.

* C. HOURIGAN—Hotel, Australia. Below knee.

I received the artificial leg and everything attached to it. I would have written before now, only I was waiting to see how it worked. I have now great pleasure to inform you that it is a perfect fit, and that it is in every way satisfactory, which I am sure you will be glad to hear.

* H. A. HOWARD—Farmer, Caswell Co., N. C. Below elbow.

I have been intending to write to you for some time. I am pleased to report that the arm fits nicely, and surpasses my expectations as to usefulness. I can plow, and use a hoe far better than I had any idea that I would be able to. The ring and hook are very useful in loading and unloading wood, in carrying anything that cannot be carried with the hand. The fork and brush do their part with satisfaction.

The rubber hand is very useful in nailing, as I can hold the nail between the finger and thumb; without the rubber hand I could not nail at all.

My stump is six inches long, and since using the arm it has improved very much, and does not pain as it did before.

* ED. HOWELL—Telegraph Operator, Cumberland Co., Tenn.

At the age of eleven I suffered the amputation of my left leg about one inch above ankle-joint. Two years later purchased an artificial leg from St. Louis. The limb was the ankle-joint style, after thirteen months' usage the joint became so worn that the foot was allowed to turn over, all attempts to repair substantially were useless. November 7, 1892, I purchased a limb from you, wearing it continually until September 21, 1903, when a double barrel hammerless shotgun fell, discharging both barrels through my artificial leg and stump, four inches above the ankle-joint, necessitating re-amputation. I was so near the gun that both shot and wads passed through, making a clean opening one and one-half inches in diameter entirely through the leg. After recovering I again brought the old leg into use, with the expectation that it would be so weakened as to render it useless, but to my surprise it has served me for another year, with no signs of breaking down.

During the thirteen years just elapsed I have walked a great deal, and over very rough country, often carrying loads of considerable weight. March 11, 1905.

LEWIS P. HUBBARD—Brass Worker, New Haven Co., Conn.

In 1896 I had a double amputation at the ankle joints. I procured a pair of artificial legs with ankle joints, which gave me a great deal of trouble. My stumps would get sore. In April, 1902, I received one of your artificial legs with a rubber foot, which has given entire satisfaction. In March of the present year I received the mate to the one I got two years ago. Both legs are giving entire satisfaction. My occupation is bench work in a brass manufactory, sitting or standing. I consider that I have as good a pair of artificial limbs as is made. May 9, 1904.

C. C. HUCKINS, M. D.—Butler Co., Iowa.

My bias is very stongly in favor of the "Rubber Feet and Hand Limbs" manufactured by A. A. Marks, on the grounds of, first and foremost, durability; in the case of the foot, solidity and firmness of footing, with sufficient pliability and no side motion, and in the case of the hands pliability. I have yet to find the person wearing either who finds any fault, which I cannot say in regard to many rattle-traps.

* JAMES R. HUDSON—Glassblower, Vigo Co., Ind. Below elbow.

I take pleasure in saying that the arm you made for me is a perfect piece of work. I am very proud of it. There is none made to compete with it to-day. Every one of my friends think it is a fine piece of work. May 3, 1904.

JOHN M. HUGHES—Hotel-keeper, Queens Co., N. Y. Below knee.

I am wearing one of your legs for the last twenty-five years and find it more than satisfactory. I have been working as a bartender being on my feet from early morning until late at night. For the last six years I have been opening and closing my own place being on my feet from sixteen to eighteen hours a day. May 6, 1904.

* CARL E. HULTING—Janitor, Cook Co., Illinois. Above elbow.

About two years ago you made me an artificial arm and I consider it a part of my duty to let you know how I am getting along with it. I take great pleasure in saying the arm has proved a God's blessing to me, as it enables me to make my own living. I am now working as janitor and meet no difficulty in doing my work. My right arm was amputated four inches below the shoulder. I have been wearing the limb every day since I received it, and could not do without it under any circumstances. May 23, 1904.

* G. L. HUME, M. D.—Quebec. Below knee.

The artificial leg sent by you to Geo. Beausoleil eighteen months ago, made from measurements sent you by me, I am pleased to state has given entire satisfaction. My patient can now walk without aid of cane or crutch, and very few people are able to detect any difference or to tell which leg is artificial and which natural. The amputation is six inches below the knee.

* G. F. HUNTER—Australia. Below knee.

Allow me to convey you my most sincere thanks for your prompt attention to my requirements. My artificial leg made from measurements, which I have had now in constant use for over two years, has given the greatest satisfaction. I have the greatest confidence in recommending your make as the best in the world. Having had twenty-five years' experience, I should be some practical authority on the matter.

* VERNON V. HUNTER—Bookkeeper, Broome Co., N. Y.

On the 15th of January, 1903, I received an injury which caused the amputation of my left forearm about five inches from elbow. I purchased an artificial arm of you. It was ordered by mail and I received it about the middle of October and have been wearing it with much satisfaction ever since. I find it very useful for many things, such as writing, eating, washing the other hand, and carrying articles. May 23, 1904.

F. C. HUNTLEY—Builder, New York City, N. Y. Above knee.

In 1892 I had my left leg amputated a little above the knee on account of gangrene following an injury that I received in my knee. In the following July I applied to you for an artificial leg. I superintend the laying of artificial stone in new buildings. This compels me to go up and down half completed stairways without balustrades and very frequently up and down ladders. I never use

a cane or crutch and walk so well that very few persons suspect that I have a wooden leg. I weigh 200 pounds and am enjoying the best of health and never miss a day from my work.

I consider your rubber foot the most valuable invention in artificial limb construction that has ever been made. June 4, 1904.

C. P. HUTCHINSON—Dauphin Co., Pa. Instep.

I am glad to testify that your appliance for my foot, a Chopart's amputation, is the finest article in the market. I am a fireman on the P. R. Road and do my work thoroughly.

W. H. IRVINE, M. D.—New Brunswick, Canada.

Mr. McLeod got his leg two months ago, and it works satisfactorily.

G. L. ISBISTER—Farmer, Columbia Co., New York. Below knee.

My limb was amputated when I was a boy of eight years, leaving me a stump of five and one-half inches below the knee. For over twelve years I continually wore an artificial leg of your make which has given perfect satisfaction. My occupation is a farmer, requiring me to do all kinds of labor, plowing, hoeing, etc. I also ride a wheel. May 16, 1904.

D. E. ISHAM—Carpenter, Chautauqua Co., New York. Ankle.

For fit, lightness and strength, your metal socket leg for ankle joint amputation is far ahead of any other leg I have worn. I know the requirements of an artificial leg having worn one for forty years. May 8, 1904.

CHARLES HUNT—Private Policeman, New York City, N. Y. Wrist.

Before I placed an order with you, I visited other firms and came to the conclusion that you made the best and most practical hand;

the results have justified me in my decision. I am a policeman and have been for the last eight years. I have on several occasions been obliged to use violence in order to hold my man, and instead of the club I have used the rubber hand. One man told me he thought he was hit with a cannon ball. February 2, 1905.

PROF. F. E. JACOBY—New Haven Co., Conn. Below knee.

When I met with the misfortune of losing my right leg, I felt that all the sunshine had passed from my life. Fortunately I came in possession of a copy of one of your books, and as I perused its pages, I received much encouragement. Some tried to dissuade me from entertaining the hope of obtaining an artificial leg inside of four or five months, but I was so determined to get about on two legs again I procured an artificial leg from you in exactly nine weeks after my natural leg was amputated. Five days after I received the leg my doctor observed me skating on the canal. He stopped and watched me; he was amazed; he told me that I beat anything he had ever seen.

I was a professional tight rope walker and aeronaut before I lost my leg, and I did not propose to allow the loss of a leg to compel me to seek another occupation. I can walk a tight rope nearly as well as ever I could. The rubber foot enables me to balance with

safety. The absence of an ankle joint removes the risk of falling to a large degree. I can walk a tight rope while it is fifty feet above the ground, and when I am dressed, without exposing my limbs, no one would suspect that one of my legs was artificial.

While walking on the ground I never feel the necessity of looking for uneven or bad places. I feel safe and sure on my rubber foot, no matter where I place it. I consider your invention of the rubber foot the most valuable and important, to persons who have lost their natural limbs, of any invention that has been made.

NOTE.—The above cut has been made from an instantaneous photograph taken of Professor Jacoby while performing on a tight rope. In the cut he is balancing entirely on his artificial leg; his natural foot is off the rope and is in the act of passing forward to take the next step.

MRS. ELLA B. JAEGER—Passaic Co., N. J. Leg short, undevelop'd.

I have solid comfort and am more than pleased with my extension. I have never before been so long without pain. I walk so much better, scarcely limp at all. I cannot say too much in praise of my foot.

April 22, 1904.

* LUCY JAMES—Cook, Madison Co., Va. Below knee.
I received the leg you shipped to me in due time and in good order. I began wearing it as soon as I received it. I now attend to my household duties without the least inconvenience. I must say that it is a God-send, for I never expected to get around again with as much ease and comfort as I do now. May 23, 1904.

F. W. JARDINE—Clerk, Philadelphia, Pa. Above knee.
Last September a year ago I received one of your artificial limbs and find it satisfactory in every detail. I have only a seven-inch stump and find it very easy to attend to my work, as clerk in a Trust Company. May 10, 1904.

* MRS. N. L. JENNINGS—Wellington, New Zealand. Son Gardner.
With regard to the artificial leg supplied by you to my son Gardner Jennings, I may say it has been and is a great comfort to him. During the last cricket season my son was one of the school team which played for and won the Junior Cup, competed for by the Hawks Bay school. The lad is fifteen years of age and is growing very rapidly. The changes that have been necessary on account of growth were made at home without difficulty. July 20, 1904.

MICHAEL JOBREY—Laborer, Schuylkill Co., Pa. Above knee.
I can walk on the artificial leg you made for me very well indeed. I never thought that I would be able to do so well. Nobody can tell whether I have an artificial leg or not. I go to school, during vacation time I work in the coal breakers and the leg serves me well. May 17, 1904.

* P. JOHNS—Hotel-keeper, Salt Lake City Co., Utah. Knee.
I am glad to say that the leg you made me I have been doing well with. I have not come across a man that could outwalk me that wore an artificial limb, no matter what make the limb was. I have not lost a day since I commenced work with the leg. I cut lawn, sprinkle and wash buggies and do it as quickly as anybody else. I will have no other but a Marks' leg. May 9, 1904.

* WILLUS JOHNS—Coal Miner, William Co., Illinois. Below knee.
I walk one and a half miles to my work and that makes three miles in all. My occupation is digging coal, I load from ten to fifteen tons of coal a day. I am enjoying life in wearing Marks' leg. May 4, 1904.

* ARTHUR JOHNSON—Farmer, Bibb Co., Georgia. Below knee.
I received the artificial leg you made for me January 9th and found it to be all right. I can plow, cut wood, and do all my own work such as shoeing horses, mules, and general repairing.
May 18, 1904.

C. C. JOHNSON, M. D.—Columbia Co., S. C.
I have ordered several of your artificial limbs for different persons in this State. All of them are now being used with utmost satisfaction. The leg recently secured for a young patient of mine, is so natural and useful that the acquaintances of the gentleman cannot realize that he has been maimed and is wearing an artificial leg. He and at least two others of the wearers of Marks' legs in this section are expert bicycle riders, having learned to ride since procuring your legs. I am highly pleased with your work.

* DANIEL W. JOHNSON—Mineral Water Mfr., Coffee Co., Ga.
I bought my limb of you in September, 1902, and have been wearing it ever since. It has given me good service. I am in the bottling business and able to do my part of the work. I lost my leg in January, 1898. May 19, 1904.

MISS FLORENCE JOHNSON—Domestic, Orange Co., N. Y.
My foot was amputated above the ankle when I was twelve years old. A little over a year ago Mr. Marks fitted an artificial foot to my stump. I learned soon to walk with it and my crutch became a thing of the past.
There is very little work in the household, in which I serve as a domestic, that I cannot do about as well as one with two natural feet. I walk a mile or more with ease. May 17, 1904.

JAS. JOHNSTON, M. D.—Chippewa Co., Mich.
I have no idea of ever recommending an ankle jointed limb again. Marks' rubber foot fully meets the wants.

* GEORGE W. JOLLOTA—Carpenter, Nova Scotia. Above knees.
The artificial limbs purchased from you two years ago have given entire satisfaction. I lost both my limbs from tuberculosis of the knee joints. My left leg was amputated in November, 1900, leaving a stump of only two inches, my right was amputated in February, 1901, leaving a stump of eleven inches. In August of the same year I received and applied a pair of your artificial limbs with rubber feet, which were made from measurements taken by my own physician. In the two years I have been wearing those limbs I have never felt the slightest discomfort. In first learning to walk I used two crutches, in a short time I was using two canes, at the present time I use but one cane. I can get in and out of a carriage with ease. I do a lot of rowing and handle my own boat in all sorts of weather. I have never tried to see how far I could walk, but I can walk half a mile with ease. May 13, 1904.

ELI W. JONES—Farmer, Marion Co., Illinois. Above knee.
I lost my leg March 16, 1865, in the army, thigh amputation. Have been wearing artificial legs since with more or less trouble, until eleven years ago when I got one of yours with the rubber foot. Wore it with great comfort for nine years. Two years ago you made me a new one which is as near perfect as an artificial leg can be. I walk with perfect ease. The main objection I made against your system was the absence of the ankle joint. I now find that to be the chief merit of your limbs. November 10, 1904.

JOHN L. JONES—Farmer, Rutland Co., Vt. Below knee.
In February, 1889, I had the misfortune of losing one of my legs below the knee.
After trying an artificial limb of a different make without good results I purchased a Marks' limb and have been wearing it since. I am thoroughly satisfied with the limb and highly recommend it. I am a farmer by occupation and do my farm work. May 23, 1904.

* REV. J. H. JONES—St. Louis Co., Mo. Above knee.
The limb you sent me for thigh amputation three years ago is giving perfect satisfaction. The prime and essential features combined in your limbs are: simplicity, durability, comfort and ease to the wearer. From the very first day I put on my new limb (two months after amputation), I wore it continuously and never had occasion to be without it a moment. I put it on as I do my shoes in the morning. It is the very acme of perfection. June 1, 1904.

W. R. JONES—Clearfield Co., Pa. Above knee.
The rubber foot is a grand success. I am much swifter on this limb than the one I have been wearing from another firm. I heartily recommend your work. May 13, 1904.

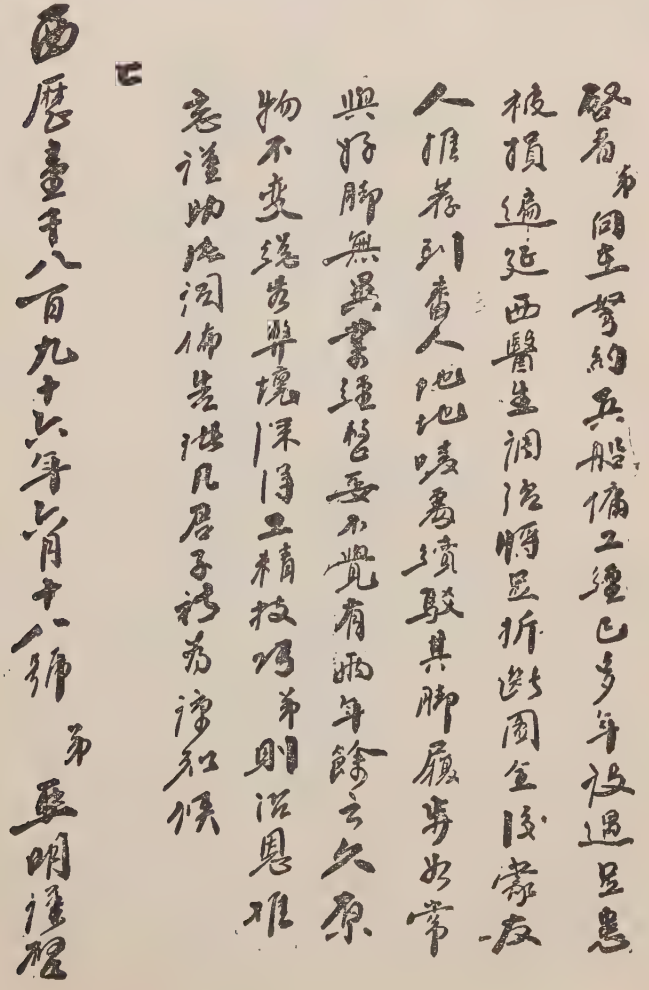
* MATTHIAS KANE—Farmer, Kingsbury Co., S. Dak. Below elbow.
I have been using your artificial hand for nearly five years with the best results.
I can pitch hay, play ball or run a wheel-barrow. It is a perfect fit, it has never hurt me in the least since I wore it. May 7, 1901.

* F. H. KAPPA—Machinist, Jefferson Co., Kentucky. Above knee.
The first artificial leg ordered from measurements at Pensacola, Fla., October, 1884, has given me great satisfaction and good service until May, 1902, when I ordered the second, which is superior in construction, especially the spring mattress rubber foot, is an improvement which I cannot praise enough.

I am a machinist by trade and experience no difficulty in following my occupation, and only experienced people can tell that I am wearing an artificial leg. May 18, 1904.

* HIS EXCELLENCY THE COUNT OKUMA OF JAPAN—Waseda, Tokio, Japan. Above knee.
I am desired by His Excellency Count Okuma to inform you that the artificial leg which you made for him reached here some time ago in good condition. The Count is exceedingly gratified with the admirable workmanship of the leg, and has already made considerable progress in walking with its assistance.

T. KATO.



THADDEUS S. KAUTZ—Conductor, Dauphin Co., Pa. Partial foot.

Having made a study of three makes of artificial feet, I came to the conclusion that the Marks' foot is the most practical of all. I have made a thorough test using the foot in the capacity of a brakeman for one year, and for two years in the P. & R. Ry. yards which has proved it the best foot known. May 17, 1904.

* SYLVANUS J. KEITH—Tailor, Nova Scotia. Both below knees.

Twenty-three years ago I had both of my legs amputated below knees and had been wearing artificial limbs with ankle joints for twenty years with much trouble and dissatisfaction. One year and a half ago I purchased a pair of your artificial limbs with rubber feet attached and since then the trouble so common to me for so long has disappeared. I am engaged in the tailoring business and do all the cutting, which means that I am on my feet most of the time. I go about the store up and downstairs and out for short

walks without the use of a cane and without the unpleasant squeaking and rattling of joints which used to annoy me so much. The rubber foot does not produce that wooden leg sound so often noticed from less modern appliances and I have no hesitation in recommending your artificial legs with rubber feet as being the very best on the market. April 25, 1904.

JOHN J. KELDER—Machinist, Lackawanna Co., Pa. Wrist.

My hand was amputated at the wrist and with the use of the hand I got from you I sometimes forget that I lost my natural hand. I have met persons that had arms of other makes but after examining my hand (A. A. Marks'), they acknowledged it was decidedly the best. I have run a dynamo and fired boilers.

I am now running and firing a small mine locomotive for the Erie R. R. May 5, 1904.

* JOHN KELLY—Teacher, Newfoundland. Below knee.

About twelve years ago I met with an accident which caused me to lose my foot three inches above the ankle.

For eight years I wore an artificial leg with movable ankle joint and it was always a source of annoyance.

On one occasion when about thirty miles from home in a crowded city, I was going along very nicely, priding myself that within an hour I would be homeward bound, when to my chagrin the foot left the boot entirely, having parted at the ankle, and there I was left on a lee shore with one of my spars gone. My embarrassment can be better imagined than described. Spectators on all sides, one "wag" remarking that I "Had turned my wooden leg inside out." I hailed a passing team, got towed to port (my boarding house), where I had to remain three days until repairs were effected. I would not wear one of the ankle joint legs again if I got it for nothing. The foot I am wearing now was purchased of you and I am wearing it two years to my entire satisfaction.

I cannot speak too highly of your patent foot with rigid ankle joint. When one is walking the step can be made with confidence be the street rough or smooth. My leg was fitted from measurements and I am surprised that it is so comfortable. In the winter season I often indulge in the pleasing pastime of skating, and can use the skates very well. Strangers cannot believe on being told that I wear an artificial foot, and my friends are surprised at the great change in my gait. April 26, 1904.

SAMUEL P. KEMP—Farmer, Lawrence Co., Pa. Above knee.

My artificial limb is working fine, I have had more comfort in the year I have been wearing A. A. Marks' leg, than I have had in all the time before, about twenty-eight years.

My stump is just eight-inches long and I can walk good without

a cane and I can do almost any kind of work on a farm. I can plow, plant corn, dig and shovel clay or pitch hay and chop wood and other kinds of labor as well as any other man. May 9, 1904.

* LINSON KELLY—Farmer, Crenshaw Co., Ala. Below knee.
I ordered an artificial limb from you about fifteen years ago. I had it made from measurements while I remained at home. I have worn it every day since with the best of satisfaction. I am now seventy-two years old. May 22, 1904.

STEPHEN T. KELSEY—Litchfield Co., Conn. Above knee.
I have received my new leg and thank you for it. This is the fourth leg you have made for me and they have all been satisfactory. I commend the mechanism and workmanship of your legs. May 30, 1904.

DR. E. J. KEMPF—Dubois Co., Ind.
The arm and hand of Joseph Goetz were received, and Goetz is well pleased, and even more than that, he is tickled. He can write his name and do any kind of light work.

* JOHN KEMPER—Grayson Co., Texas. Instep.
I have been wearing your artificial foot for instep amputation for the past ten years, and it has given me perfect satisfaction at all times. I can cheerfully recommend the same as the best made. May 11, 1905.

JAMES J. KENNELLY—Produce Clerk, Brooklyn, N. Y.
On the 15th of November, 1893, I began to wear one of your artificial feet. I had my leg amputated six inches below the knee as the result of a railroad accident. I was then twelve years old. I continued my studies and graduated from the High School of Commerce of this city without any of my fellow students knowing that I wore an artificial foot. I am at present employed in the produce business and have worn your foot for days without removing it, and have never felt any bad effects.
I am a member of the Royal Arcanum and there are not three members of my lodge know that I wear an artificial foot.
May 5, 1904.

* CHRISTIAN KEPPLER—Steel mills, Lorain Co., Ohio.
I am more than pleased with the artificial leg I bought from you some time ago. I am working in the Lorain Steel Mills and do any kind of work with it, I have never lost work since I have had it, in fact I do not realize that I have an artificial leg. May 15, 1904.

* GEORGE OSCAR KINARD—Packer, Bibb Co., Ga. Below elbow.
The arm I got from you was the cause of my securing a better position than I have ever had. I have been in the company of strangers for several hours at a time and they did not discover that I had but one natural arm. I am getting along with it first rate, and would not do without it. May 12, 1904.

* W. F. KLECKNER—Car Checker, Schuylkill Co., Pa. Below knee.
The artificial leg you made for me has given so much satisfaction that I would not part with it for any consideration. I have been traveling with friends that did not know I had my leg off until they were told. This goes to show that I walk very well. My leg is off one and one-half-inch above the ankle. My occupation is car checking for the P. R. R. I walk to and from work two miles each day, the walking does not bother me at all. I shall recommend your make of legs at all times. May 7, 1904.

REV. J. W. KNAPPENBERGER, A. M.—President, Allentown College for Women, Lehigh Co., Pa. Above knee.
I have been wearing A. A. Marks' artificial limb since 1890. I have found it satisfactory in every particular and I consider it the best in the market. It is comfortable, easy to manage, wears well, and protects from injury. May 5, 1904.

GEO. D. KERNS—Jefferson Co., Mont. Knee bearing.

In regard to my experience in using an artificial leg will say that I have worn one thirty-one years.

The first rubber foot I wore for twelve years, and the second to date. The rubber foot cannot be any more and be artificial. It gives a soft, safe step. I am a stone mason and builder. My work is on rough ground, with spall, fragments, and rubbish as

usually seen about stone buildings while under construction. This is the place to test an artificial leg. No other leg ever did so much good. It has a stiff ankle joint which is really its charm.

I can stand on the heel or toe at will; this gives me great advantage in turning about and getting around lively.

If on a sidehill, roof, or ladder the ankle-joint foot is not safe, but the rubber foot is always safe.

* WILLIAM KNEIPP—Cattleman, Australia. Below elbow.

The hand I got from you gives every satisfaction. I can use the knife to cut my food quite well, and I hold the reins in the artificial hand when driving and riding. It is worth double the money for looks only. It makes a man look as if he had nothing the matter with him. June 18, 1904.

R. B. KNIGHT, M. D.—Mohave Co., Ariz.

The leg I ordered for Mr. Sorrensen three years ago was all that could be desired.

G. FRED KOHLER, JR.—Bergen Co., N. J. Below knee.

I have been wearing one of your rubber feet now since March 9, 1904, and have not had any chafing of the stump or any other difficulty. I do not limp at all. Considering that I had one foot mashed at the time I was run over, which is not healed yet, I know I do remarkably well. Most people ask me which foot is the artificial. Nov. 3, 1904.

HENRY KUEHN—Designer, Hudson Co., N. J. Above knee.

I used a cane for about two weeks at the start when I received my leg. I have a ten-inch stump and never had my leg off since I got it, except to retire at night. May 10, 1904.

* J. VICTOR KULP—Fireman, Berks Co., Pa. Above knee.

It is now a year since I purchased my leg from you and I feel it is my duty to let you know just how I am getting along. I lost my leg while firing on a locomotive for the Phila. & Reading R. R. It was amputated about six inches above the knee. I am working every day on the P. & R. R. R., twelve hours a day, doing operating and throwing switches, so you see I don't have much time to myself. If I were not so active on my feet I could never hold this position.

The leg is working to perfection and I am glad I took your advice and got a leg without an ankle joint, as I have seen legs made with cords and they were regular rattle boxes. I know a man who wears a cord foot and he tells me that he keeps an extra set with him all the time in case he breaks down. I can walk almost as natural as I could before I lost my leg. One not knowing of my loss could not tell the difference. June 18, 1904.

GEO. W. KUTCH—Boatman, Schuylkill Co., Pa. Below knee.

I am wearing your make of artificial limbs since 1886. I am what is commonly called a waterman, and work upon a barge. Your leg gives entire satisfaction. It gets damp, occasionally wet, but no ill effects result. I can perform my work as well as those who have their two natural legs. In winter time the barges are often covered with ice, which makes walking very uncertain, but I can get around as well as most who have their natural legs. May 17, 1904.

* PETER KUTCHERA—Marathon Co., Wis. Below elbow.

The artificial arm I got from you some time ago has far surpassed my expectations. The rubber hand is certainly a good invention. I can carry a grip or bundle with it, I can also close and open my latch door. My right arm being amputated two inches below the elbow. I had no idea that I would have any control of the artificial arm. May 16, 1904.

* WALTER LACY—England. Above knee.

I have now worn your leg for thirteen years, and am very glad to say I am quite satisfied with it. I was fitted from measurements. The point of amputation is about two inches above the left knee.

I am glad to be able to say the cost of repairing the limbs made by you is so little that I could not attempt to reckon it up.

* E. L. LAIRD—Crawford Co., Kan. Daughter age 6. Above knee.

It is with pleasure I inform you that the limb purchased for my daughter is giving the best of satisfaction, far better than I supposed it were possible considering the location of the amputation, her stump is a very short one above the knee. I heartily recommend your work. June 23, 1904.

* HARRY M. LAIRD—Drug Clerk, Monmouth Co., N. J.

I have given the limb you sent me a thorough trial. I can say that I am well pleased with it. It seems to be what I want. Last week I walked half a mile and was no worse for it. I want to thank you for the satisfaction you gave me. You may use my name as reference. November 1, 1904.

* RODOLFO LAMBEA—Farmer, Cuba. Below knee.

I am well pleased with the artificial limb you sent me. I am working on a farm and use your artificial leg to great advantage. I thank you for what you have done for me.—Translated from Spanish. May 10, 1904.

* THOMAS LANGTON—Herbalist, England. Above knee.

I have received the leg you made for me and having now worn it for the last three weeks, I have much pleasure and satisfaction in testifying to its qualities, which are in every particular as good

as one could wish. It is comfortable, light, strong and safe, the finish and mechanism are a great improvement on those I have previously worn. I desire also to express my gratitude to you for your patience, persistence, and unfailing courtesy in bringing about this most gratifying result. Shall recommend your firm whenever possible. Aug. 8, 1904.

* R. M. LANIER—Tax Collector, Ware Co., Ga. Below knee.

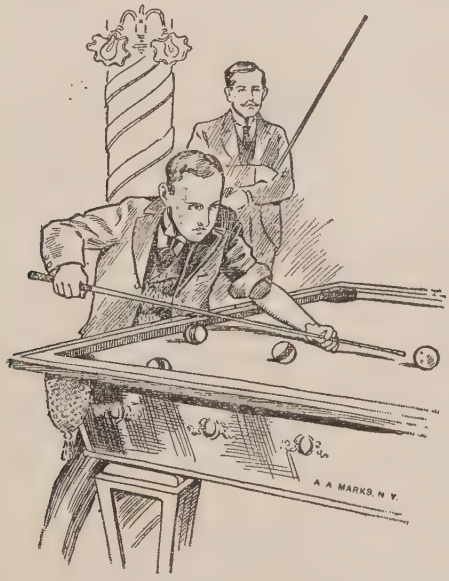
About twenty years since I lost my right leg just below the knee, and since that time I have used three of your artificial limbs, only recently having purchased a new one. I have always found them to be comfortable and durable in my work. I am Tax Collector of Ware County, Ga., which occupation carries with it considerable walking, and I get around with all ease and comfort. I don't think your class of work is surpassed by any. May 4, 1904.

* MRS. MARY LANO—Todd Co., Minn. Below knee.

I have worn one of your artificial limbs for the last nine years, the first one I had worn seven years, the second I got two years ago, both made from measurements. I am well pleased with them. I am sixty-one years old, and can do all my housework. May 14, 1904.

* EDWARD W. LASLEY—Laborer, Antrim Co., Mich. Below elbow.

I lost my arm below the elbow last October. I had one of your artificial hands made by measurements, and have worn it every day since. I am greatly pleased with it. It fits perfectly, and with



the glove on one could not tell it from the natural hand. I do most anything with it. I can punch the bag, play pool, and box with it. I find it very useful, and I wouldn't be without the hand for anything. May 30, 1904.

* DR. MARIUS LAURITZEN—Physician, Denmark. Above knee.

I am much obliged for the leg you sent me. I am wearing it now for two months, and it fits very well, and I can walk well with it, and without any trouble.—Translated from German. Jan. 8, 1905.

ALLEN ROBERT LAW, M. D.—Dane Co., Wis.

The pair of artificial legs I ordered of A. A. Marks about ten years ago for Jno. Nodolf are wearing well and give perfect satisfaction.

* BAPTISTE LEBOIX—Driver, France. Above knee.

After wearing your artificial leg with rubber foot for two years, I am pleased to recognize all the merits your make deserves. The leg is comfortable, and construction is simple. I have as yet had no need for repairs, and have subjected it to hard tests every day.—Translated from French. Nov. 23, 1904.

JOSE MARIA LEBRON—Porto Rico. Knee-bearing.

I see no reason why my name should not appear in your new treatise, since from 1882 until to-day I have used the same artificial leg without having sustained any deterioration in that time. Expressing to you my most sincere thanks for the good service that limb has given me, by which I work and earn my daily bread.

* MISS FLORENCE M. LEE—School Girl, Washington Co., R. I.

It is two years this month that you made for me the leg, and I am doing nicely with it; the former leg made by you was applied when I was four years old, and I wore it eight years. I work and walk every day. I have no trouble whatever with it, and have worn it all the time since you made it for me. May 14, 1904.

* PATRICK W. LEE—Trooper, New Zealand. Above knee.

I was a member of one of the New Zealand Contingents, in active service during the Boer War, and lost my right leg as a result of injuries received in the Western Transvaal. The amputation is about five inches above the knee. Acting on the advice of a clergyman, who is himself wearing one of your limbs, I obtained one, and have worn it every day since.

It is a wonderfully good substitute, and to a great extent removes the disability imposed by the loss of the natural limb. I am not engaged in any particular vocation at present, but do a lot of walking, and can get about with but little inconvenience.

May 14, 1904.

WILLIAM LEES, M. D., C. S., L. S. A.—Chester, England.

The arm for Williamson has arrived safely and fits him perfectly. I am highly pleased with it, and intend to show this patient and his arm, and also Mr. Howson and his leg, at our Chester Medical Society. I consider them triumphs of mechanical art.

* ARCH. LEITCH—Farmer, Ontario. Below elbow.

I have found the artificial arm you made for me of great assistance, and would not be without it for considerable money. I am enabled to do almost all kinds of farm work, and engage in most all the sports at college. Dec. 11, 1904.

* H. E. LEWIS—Grocer, Washington Co., R. I. Below knee.

I have been using the artificial leg you made for me some years ago continuously, and am up and down a step-ladder a great deal, and feel perfectly safe. My weight, at the present time, is 214 pounds. I never use a cane, as I can walk better without it.

Aug. 17, 1904.

CHAS. LIBENAU, M. D.—New York. Below knee.

After an experience of over twenty-two years in the use of your patent artificial leg with rubber foot, I desire to say that it has given me first-rate satisfaction. About eighteen years ago I was induced to purchase a leg of Mr. ———'s make, with his wooden foot and ankle joint. After using it for nearly two years, with constant repairs, I abandoned it, and am now using yours again. That trial

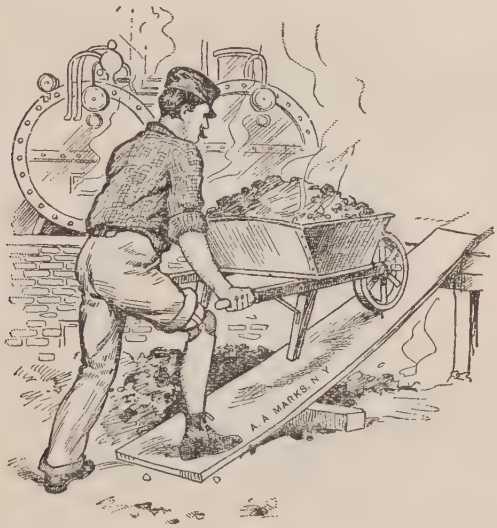
was enough for me; I want no more ankle-jointed wooden feet for me on an artificial leg, so long as yours are to be had, as my own experience proves their superiority.

LEWIS M. LINES—Railroad, Mifflin Co., Pa. Partial foot.

I received my foot all right, and it suits me very well. Good-by. I am well pleased with your work, and also with you. May 17, 1904.

PETER L. LEE—Watchman, Worcester Co., Mass. Below knee.

Your leg is all that you claim for it, in fact, it is much more. I am night watchman in a large worsted and carpet mill, which requires my walking up several flight of stairs every night. I am



twenty-five minutes on the go winding clocks. I also have two large boilers to take care of, and have to wheel fourteen to sixteen large wheelbarrows of clinkers and ashes every night up an incline two and a half feet in ten, which I do without trouble.

The artificial leg that I wore before I got yours gave me much trouble, and kept my stump sore and irritated nearly all the time. It compelled me to undergo a second amputation. May 3, 1904.

J. S. LINDLEY, M. D.—Indian Agency, I. T.

I deem it due to you to say that the artificial leg you furnished the Indian Department for Joe Chilchuana, the Apache Indian, gives the utmost satisfaction in every respect. The young man wears it with the greatest ease, satisfaction, and comfort, and is delighted with it. One who does not know that he is wearing an artificial limb would not detect it in his walk. You are to be congratulated upon the satisfaction your work gives.

* C. L. LINVILLE—Sawmill, Bridgeport, W. Va. Ankle.

I received my new artificial foot, it is all right. I have been working on a sawmill for four years. July 23, 1901.

* BERTRAM LITTLE—Clerk, Newfoundland. Above knee.

When I was nine years of age I had the misfortune to lose the use of my right leg. I ordered a leg of your make. Words cannot express the satisfaction it has given me.

I have worn it for two years continuously, and to-day I can walk five miles, which is wonderful, considering my leg is off above the knee joint, leaving me a stump of about six inches. May 8, 1904.

ENOS LINCOLN—Saline Co., Kansas. Above knee.

After having worn your artificial leg with rubber foot for more than thirty years, I have no hesitation in saying it is the best leg in use; it is simply the most durable of any of the many I have seen. The rubber foot with stiff ankle is unquestionably the best and softest leg made; it never drags at the toe from weight of mud. It is so simple a child can adjust it. I have worn artificial legs

since 1862, and do all kinds of work. I am a blacksmith, and shoe horses. I have dug wells, and quarried stone, and other heavy work. I can walk farther in a given time than any man on any other kind of a leg, with the same length of stump as mine; it is only three inches from center of hip joint.

* ARCHIE LIVINGSTONE—Laborer, Cassia Co., Idaho.

I got my legs amputated in December, 1901, and received artificial ones from A. A. Marks, June, 1902. I have been wearing them ever since; they were made from measurements, and fit right. They have not bothered me at all. I am a rider, and can get on a horse quicker than many that have not lost their limbs. May 23, 1904.

JULIO LLUBERES—Conductor, Santo Domingo. Above knee.

A month after amputation I had an artificial leg applied at your establishment, and upon my arrival here I filled the position of conductor of a passenger and freight train for three months, and for the past year I have discharged the duties of the Station Agent at Bajabonico, 18 kilometers from Puerto Plata, both of which I have performed satisfactorily. I can put the leg on in two minutes. I walk a great deal, both for work and pleasure. I have got on the train when the locomotive was under very rapid headway. I can assure you that I am well satisfied with the leg, and believe it the best in the world.—Translated from Spanish. Oct. 12, 1904.

* FRANK LOCKE—Audrain Co., Mo. Below knee.

I get around on my artificial leg fine. I can go any place now. Thanking you very much for your excellent work. May 8, 1904.

* GIROLAMO LORENZONI—Lawyer, Italy. Above knee.

In September, 1895, after thirty years of suffering, I had my right leg amputated, above the knee, leaving a very short stump. I obtained an artificial leg made in Padua. I walked very badly with it, and was in despair, when fortunately one of my friends made me acquainted with your firm. In 1897 you furnished me with a magnificent artificial limb, which I have worn ever since. I am most contented with your system, especially the construction of the foot, which is unimprovable in every respect.—Translated from Italian. Feb. 2, 1905.

* MISS EMMA C. LOTT—Laundry, Goliad Co., Tex. Below knee.

I am well pleased with the artificial limb I purchased of you. It is apparently as good as when I first put it on. My occupation is washing and ironing. I find it durable, easy, soft, and comfortable to wear. May 10, 1904.

* EBEN P. LOW—Hawaii. Below elbow.

I cannot give enough praise for the best material that you used in making my artificial hand, for it has stood the test well. I am a cattle rancher. My natural hand was badly lacerated by being fouled with a lariat while lassoing wild cattle on the mountains here. The loss of my arm does not in any way deter me in my business.

* J. A. LUKE—Terrebonne Co., La. Below elbow.

On March 5, 1904, I bought of you an artificial hand, for amputation below the elbow. Have worn it constantly since. On many occasions it has been mistaken for a natural hand. I am perfectly satisfied with it. Fits perfectly. May 9, 1904.

* THOMAS F. LUSH—School Teacher, Lycoming Co., Pa.

I am now wearing my second artificial leg, both made by you, and I can truly say that they have both been satisfactory in every respect. Your artificial limbs are a combination of lightness, durability, and strength, which makes them superior to any other artificial limb that I have ever seen. I wear a knee-bearing leg. The last one that I purchased from you I took my own measurements, which almost anyone can do by your system. May 4, 1904.

* I. N. McCALLISTER—Stock Raiser, Greenwood Co., Kan. Ankle.

I have used one of your artificial legs for thirteen years, and am still using it. It has given me good service, and satisfaction, and I have done almost every kind of work, such as farming, handling stallions, jacks, and doing other rough work. The new limb is all right. I can cheerfully recommend your work. May 3, 1904.

* C. B. McCREERY—New London Co., Conn. Partial hand.

For two years I have worn an artificial hand made by your firm, and have been told by others with but one hand they wished theirs looked as good as mine, and I have been asked which was the artificial as I carry packages in both. May 5, 1904.

* J. N. McCUTCHEON—Court Clerk, Hamilton Co., Tenn.

I have been wearing one of your artificial limbs for about fifteen years. My leg was amputated about three inches above the knee. Your limb has given me perfect satisfaction. I am County Court Clerk for Hamilton Co., Tenn., and have a great deal of walking to do, I have no trouble in keeping up with anyone with two natural limbs. May 3, 1904.

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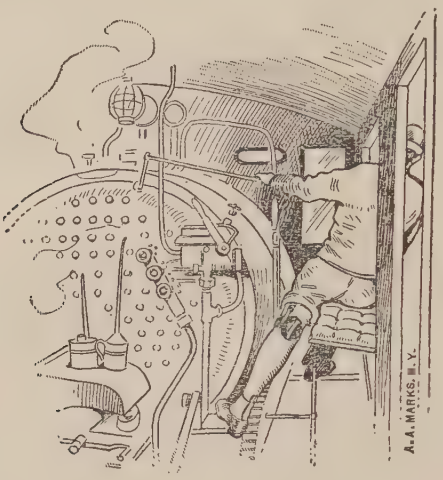
* All testimonials marked with the asterisk * were written by persons whose artificial limbs were made and fitted from measurements while they remained at home.

* ALEX. McDONALD—Engineer, Nova Scotia. Below knee.

I am happy to say that I have worn one of your legs for the last four years, I feel convinced that no better can be made. I have frequently been in the company of people who never suspected



that I was wearing an artificial leg. I attend my work every day, which is engine driving. I had my leg taken off five inches above the ankle joint. April 25, 1904.

* A. W. McEWAN—Secretary, South Africa. Above knee.

The artificial limb you so skillfully made for me, to accommodate an amputated thigh 2⅛ inches from the crotch, has arrived here in good order, and after a fortnight's wear, I am enabled to use the limb with the greatest of ease and comfort. I consider it a wonderful arrangement in every particular, especially noting the easy, noiseless, and reliable knee mechanism, and the delightful natural suppleness of the rubber foot, which gives one a great amount of impetus in walking.

Previous to getting your limb, I had been wearing one with articulating joint at the ankle. I was forced to use two canes to assist me in walking; now I am able to walk with the greatest ease and comfort without canes. Sept. 6, 1904.

J. H. McFADZEN—Lawyer, New Brunswick, Canada. Above elbow.

The artificial arm I purchased from you while in New York, last May, has proved satisfactory. I find it of great assistance, very comfortable, and it has developed the muscles of my arm and side, got them back into their normal and healthy condition, and besides it is of great benefit to my appearance. I have very much pleasure indeed in recommending same, my only regret now is, that I had not purchased it sooner.

My amputation took place fifteen years ago, above the elbow. My profession is that of a barrister. On account of the mechanism of the rubber hand, I find no difficulty in holding papers, books, etc. I also find it very useful in driving a horse, carrying a valise, and in fact, were it not for the wearing of a glove, it would often be hard to detect the artificial from the real. As I am a bit of a sport, I often engage in lawn tennis, billiards, etc. April 26, 1904.

* LEO McFARLAND—Republic Co., Kas. Knee-bearing.

I have had my leg since last August, and must say that it is, and has been, giving entire satisfaction.

My leg is cut off about one inch below the knee, and for about two years I wore a slip socket leg, which did not do very well. I am now wearing your knee-bearing leg, and it is giving me no trouble whatever.

I will recommend your limb whenever I get a chance, and take pleasure in doing so. May 16, 1904.

DR. W. M. McGALLIARD—Ascension Co., La. Below knee.

The artificial leg made by you in 1902 has given perfect satisfaction for nearly two years, being lighter and simpler in construction than any other. April 29, 1904.

JAMES A. McDONALD—Westchester Co., N. Y. Both below knee.

Over twenty years ago I met with the misfortune of having both my legs crushed by the railroad cars, which necessitated amputation below the knees. I was then a mere lad, and did not fully realize the gravity of my misfortune.

By the advice of my surgeons and others, I placed myself under

your care for restoration. Your reputation as the one most competent in the land had so impressed me that, from the first, I felt that I was soon to realize the most that skill and ingenuity could possibly do for me. In this I have not been disappointed, for your labors have restored me to my feet, and I am, for all practical purposes, myself again. I well remember how proud I was when your genius placed me in a position in which I could indulge in youthful sports, how I availed myself of every advantage, playing ball, boating, fishing, and hunting in summer, and skating in winter. I even went so far as to swing my partner, on several occasions, at rural dances. I have always felt that your artificial legs were wonders, and ought to be known throughout the land.

My latest fad is that of riding a bicycle. I found the task difficult at first, but I succeeded after repeated attempts, to ride well and to enjoy it.

* SAMUEL McKEE—Belfast, Ireland. Below knee.

The leg arrived some time about the latter end of June, 1875, and I have been wearing it ever since. I would like to get another just like it. The limb I have has a rubber foot for amputation below the knee. It is a pity you have not an agent here, for there is only one party in this city who makes artificial legs, and they are not to be compared with yours for durability, neatness and comfort.

* S. B. McKEE—Lawyer, Alameda Co., Cal. Both below knee.

I take great pleasure in testifying to the merits of your artificial limbs. I have used them for about eleven years.

They were fitted from measurements. I have worn them constantly without any trouble. I am by profession a lawyer.

Your legs are the best made.

* R. A. H. MacKEEN, M. D.—Cape Breton, Nova Scotia.

I am happy to say that having worn one of your legs for the last fourteen years, I feel convinced that no better can be made. I have been for quite a while in the company of people who never suspected that I was dependent on a "cork leg" (as they *will* call it) for support. The limb you furnished the boy, Daniel McLean, from measurements taken by me, has given good satisfaction, and he runs around with his playmates almost as if he had never met with a misfortune.

* NEIL A. McKENZIE—Miner, Nova Scotia. Below knee.

I had my foot amputated above the ankle when I was but four years old. Some years afterward I had a leg manufactured by you, from measurements. It fitted so well in every respect that when it became necessary to order another, I did not hesitate in ordering from you the second one. I am wearing the third leg now, and have worked in every capacity in a coal mine, from trapper boy to mine overman. I have also worked in the lumber woods, and as a sailor, my shipmates not knowing that I was minus a foot. Oct. 12, 1904.

* J. A. McKINZIE—Farmer, Comanche Co., Tex. Below knee.

In September, 1894, my left leg was amputated six inches below the knee. I was then thirteen years old, and am now twenty-three. I am still wearing your make, and would not have any other, for the reason your legs wear better, and are more comfortable to the wearer than any other. I am a farmer by occupation, can walk all day, plowing, or any other kind of work. May 1, 1904.

R. W. McLATCHY—Collector, Westchester Co., N. Y. Above knee.

I lost my leg when but a child. I have only six inches of a stump, and thought I could never use an artificial leg. I went around on crutches for some years, but that got tiresome, and I bought a leg from a firm out in Canada, which proved a failure. I could not walk without a cane. About eight years ago I tried one of your legs, which was a great success. I am walking without a stick. In fact, I never use a cane, and walk at least ten miles a day. I am a collector, and that requires a lot of walking. I cannot say too much of your leg. It is strong, durable, and easy to walk on. May 10, 1904.

* FRANK McLAUGHLIN—Railway Employee, Australia. Ankle.

Your artificial leg, supplied through your Australian agents, Denyer Bros., came duly to hand. My amputation is at the ankle joint. I am employed by the Queensland Government in their Railway Department. In their service I lost my foot. After the stump had thoroughly healed, I procured an artificial one of the articulating ankle-joint type, which I wore for a short time, and soon discovered that it was utterly useless. I am a ticket checker, which means a lot of walking through the trains. I was advised by

a surgeon here to try your make, which I find is much lighter than the first one I procured, and enables me to get about my duty to perfection. In fact, many people, that are not aware of my misfortune, cannot discern that I have lost my foot. In conclusion, I must thank you for conferring such a blessing upon suffering humanity like myself. June 9, 1904.

EDWARD A. MACKESEY—Weaver, Albany Co., N. Y. Instep.

I am very much pleased with my foot, and get along very good. I can walk without a lame step, and intend to get another in a very short time, so as to have a duplicate. Dec. 12, 1904.

* J. MADDEN—New Zealand. Below knee.

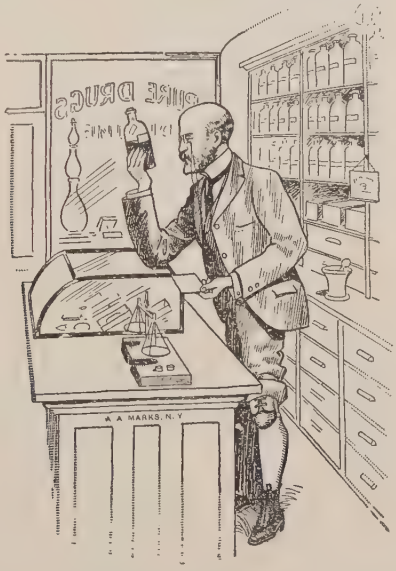
My leg was amputated below the knee on August 2, 1887. In the following March I got my first artificial leg with ankle joint, which I wore until April, 1891, when I got one of your celebrated artificial legs with rubber foot, which I am still wearing, now almost eleven years, on an average of sixteen hours a day. Five years in Auckland as watchman of the Customs building, and the remainder here on the Queen's Wharf Customs Dept. During that time its expenses were nil, except a little for bushing the knee-bolts, whereas with the ankle-joint leg I was continually putting my hand in my pocket.

It would be only foolishness for me to try and explain or describe the benefits I have received, especially from the rubber foot.

No matter what you may hear regarding other makers, write to Mr. Marks for measurements and diagrams. Have them taken accordingly. Send for one of his celebrated artificial limbs. He can fit you just as well as if you were in his shop.

* A. E. MAGOFFIN—Druggist, Rice Co., Kas. Below knee.

I was a soldier of the Civil War when I was crippled in 1863, resulting in amputation of left leg below the knee. I immediately



ordered a Marks' leg, and have worn no other since. I get around very well, and have attended to my drug business for forty-eight years. The legs have given full satisfaction, and I have no desire to change for any other make. April 28, 1904.

* CHARLES MADDOX—Sawyer, Stoddard Co., Mo. Below knee.

I have been wearing an artificial leg from your company for some time. My occupation is sawing in a stave mill. I get along very well. I have not lost a day on account of my leg. May 30, 1904.

DANIEL MAHONEY—Brakeman, New York City, N. Y. Instep.

I have used one of your artificial legs for the last ten years, and found it all right. My foot was taken off at the instep. In my

position as a brakeman I can do my work without any trouble whatever.

From my experience in using your leg, I verify all you claim for it. May 7, 1904.

REV. E. L. MAINES—Clergyman, Wayne Co., N. Y. Below elbow.

A little more than a year ago I had my left arm amputated about five inches below the elbow. Two months and a half later I went to A. A. Marks' establishment, in New York, to investigate their artificial limbs. I had been advised to get an all-willow hand, but thinking of the advantages of rubber over willow, I decided to personally investigate the matter, so made a special trip to the city. I am glad to say that so far I have found much comfort in wearing the Marks' Rubber Hand. At first the stump and body were sensitive to the touch of the arm and strap, but I now wear it constantly with ease, and would do without it under no conditions. I am at present serving a country appointment in the Central N. Y. Conference of the M. E. Church, and I find the hand of great value in utility and appearance. May 4, 1905.

S. L. MANHART—Engineer, Rice Co., Minn. Wrist.

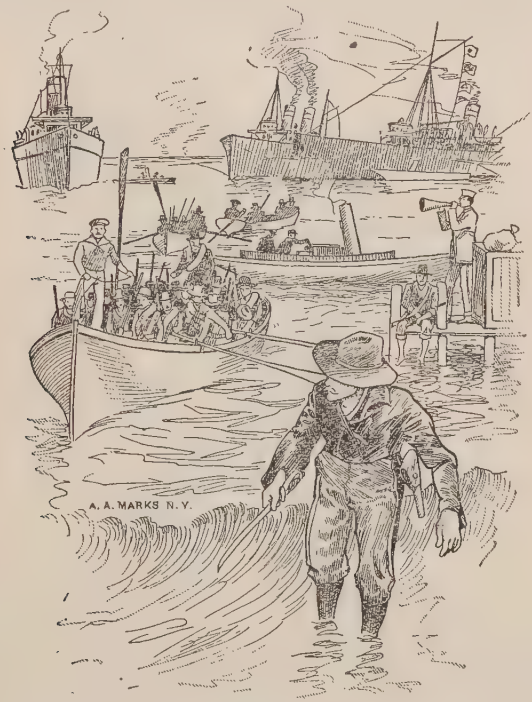
I am wearing one of your hands, and have been wearing it for three years, and hardly know how I could get along without it. Anyone wishing to purchase one can be referred to me. May 6, 1904.

WILLIAM MANN—Gardener, Montgomery Co., Pa.

I thought I would write and tell you how I am making out with my artificial arms. I can get along very nicely. I can eat all right, and can dig garden pretty well, and write this letter with the right rubber hand. May 9, 1904.

EDWARD MARSHALL—New York City. Left leg below knee.

The Spanish-American War was remarkable less for its loss in killed and wounded than for its loss from disease in camp, etc. Yet a number of most astonishing wounds have been placed to its credit or debit in medical histories and reviews. For instance, in one case, a soldier—one of the Rough Riders—was shot in the middle of the outside of the left thigh. The wound of exit was in the middle of the right thigh. The natural supposition of the doctors was that the ball had penetrated both legs. An examination showed them, however, that this was not the case. The ball had entered the left thigh about midway between the knee and the hip. It had gone upward, and then across, through the lower abdomen, and finally downward to a point in the right thigh, almost exactly opposite to the point where it entered the left thigh,



and passed out. Just what influenced the ball to take this course is one of those mysteries that puzzle the doctors.

The Spanish-American War was the first conflict in which small caliber bullets of great velocity were used by both sides. In the Civil War a wound in the lung from a Minie ball was almost certain to prove fatal. In the Spanish-American War with their new small caliber, high velocity Mauser and Krag-Jorgensen bullets, scarcely a single fatality came from a wound in the lungs.

Perhaps as remarkable a case as occurred during the entire war was that of Edward Marshall. Marshall was not a soldier, but a newspaper correspondent; yet, the story of his misfortune and suffering is probably as widely known as that of any soldier in the army.

He was one of the only two correspondents present at the battle of Las Guasimas, the first important land fight in which the army

took part. It will be remembered that only the marines—the military branch of the navy—were engaged at Guantanamo. Marshall had landed at Daiquiri with the troops the day before the march to the front began, and learned that the Rough Riders were likely to be engaged in battle on the twenty-fourth of June. He marched the nineteen and a half miles through the jungle to Siboney with the famous regiment which is so closely identified with the name of President Theodore Roosevelt, reaching that strange little collection of Cuban shanties late at night. The next morning at four o'clock he started to the battlefield with the regiment with which he had cast his lot. It was a fearful climb over the precipitous hills and along the narrow jungle trails. How cleverly the Spaniards had gauged the route over which the men must go, and what a baptism of blood awaited them at the end of that last trail, are now matters of history—history whose punctua-

tion marks are more than thirty graves in the National Cemetery at Arlington.

When Marshall started out on that march he was as strong a man physically as ever had toiled along under a broiling tropical sun. While many trained soldiers fell by the way, Marshall, a newspaper man, carrying a burden of equipment, cameras, etc., probably much heavier than the kit borne by any soldier, stood the heat almost without discomfort. Because of his business of news-gathering he had many times to visit other regiments marching in the same direction, and to continually double back and forth among the Rough Riders. So he probably covered at least a fourth more ground that afternoon and night and the following morning than any unmounted soldier in the army. When the regiment reached Las Guasimas he was not the least fatigued. After the regiment had reached the field of battle and he had been for an hour at work along the firing line and among the dead and wounded scattered about the field, he still felt no need of rest. But his activity ceased just before the battle ended. In the advance on the

old Spanish distillery which was the temporary headquarters of the Spanish army, a Mauser bullet hit him in the spine. He fell instantly to the ground. In describing the sensation of being shot, and his later sufferings, we will use Marshall's own words:

"There was no pain as the bullet entered my body. I knew that I had been hit, because I had fallen, and because I had no power to move any part of my body. Legs, arms, fingers, toes—every member was wholly without the possibility of voluntary motion, except my eyes. I was completely paralyzed. The actual sensation of being hit was not a very different one from the sensation that I many times knew as a boy, when in a game I was struck by a base-ball.

"I am told that while four regulars were carrying me off the battlefield many hours later, convulsions seized me from time to

time, but I have no memory of any pain whatever until after they had placed me on the hospital ship *Olivette*. Then I suffered, and suffered severely. The bullet had hit me in the fifth lumbar vertebra, which is near the base of the spine. If I had been marked for a target the Spaniard who shot me could not have had a chance of striking a more important nerve-center than the one which his bullet found. I have no idea, however, that the man ever saw me, much less took aim at me; for if the bullet had come from close range it would undoubtedly have passed completely through my body and killed me then and there. As it was, it struck this vertebra, and shattered it, passing upward (having been deflected by the bone) and then struck me again between the shoulders. Here again the bone changed its course and the bullet turned downward, finally lodging in the right kidney, where it remains to-day."

After a marvelous operation by the much-maligned army surgeons on board the *Olivette*, Marshall was taken to New York four or five weeks later. That he reached there alive was the marvel of physicians and surgeons in all sections of the United States and Europe, and was the topic of many articles in medical journals.

For seven months he lay in St. Luke's Hospital, New York, completely paralyzed below the knees and partially affected above. Gradually, however, all signs of paralysis left him above the knees. Still, his doctors held out no hope that he would ever be able to walk. When he finally left the hospital it was necessary for him to be carried by two attendants. This state of almost complete helplessness lasted for a long time. His right leg regained some of its strength, but the nerves controlling the front muscles of the lower left leg (the tibialis anticus) were completely dead. Their support of vitality had been completely cut off by the bullet which came so near ending Marshall's life. This made it impossible for him to keep his foot from drooping or falling down. His right leg finally recovered sufficiently so that he could essay a few steps on crutches, but the dragging of the left foot made it impossible for him to do more than a few steps at a time.

Among the artists who contributed pictures to Mr. Marshall's book on the Spanish-American War was W. Frazee Strunz, well

known as an illustrator. Mr. Strunz and Mr. Marshall had been associated in their professions for many years. Mr. Marshall, however did not know that his friend and co-worker had ever met with an accident. He spoke to Strunz one night about the possibility of having that troublesome left foot amputated.

"If you do that," said Strunz, "we shall be in the same class."

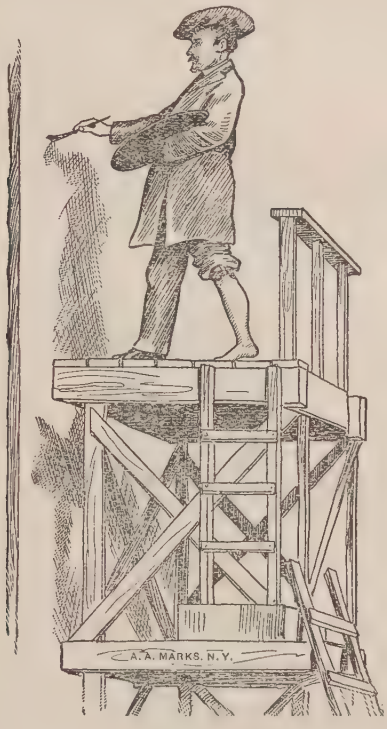
"What do you mean by that?" inquired Marshall, who knew that Strunz had been celebrated as a baseball player and sprinter among the athletic set in the Quartier Latin, in Paris, when he was there as an art student, and who was familiar with the man's intense physical activity in New York. This activity went so far as climbing scene painters' scaffoldings, when he was engaged in scenic work, a dozen times a day; in running up and downstairs to a studio located on the fifth floor of a building without an elevator, in long walks and in sprinting races.

"Why, didn't you know I had a wooden leg?" Strunz asked.

Marshall scarcely believed him until he proved his statement by showing the artificial limb. Strunz had had his limb cut off in a railway accident when he was a child of eight. The conversation

ended in Marshall's decision to see the people who had succeeded in giving his friend so perfect a substitute for a lost leg, on which he could walk without limping, run, and climb stairs and ladders with ease.

The firm which had supplied Strunz with his artificial leg was A. A. Marks, of 701 Broadway, New York, whose place of business was



not very far from where Marshall lived. A telephone message brought Mr. Marks himself around to Mr. Marshall's house the next morning. Upon examination, Mr. Marks found that there was no immediate necessity for amputation. Marshall's only anxiety for an amputation was that he was impeded in walking on account of the foot drooping so inconveniently. After a moment's thought Mr. Marks said he believed he could devise a scheme that would enable Mr. Marshall to walk, even if he could not properly hold up his toes.

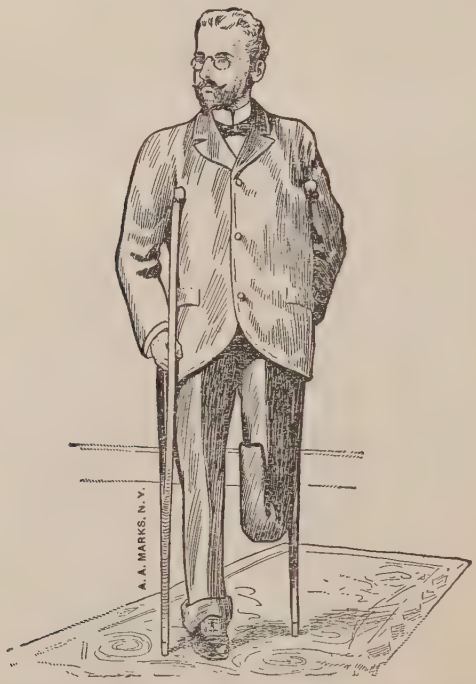
"I shall put your foot in a sling," he said.

He did so.

He made an ingenious contrivance of straps and loops which were put on in such a way as to hold the front of the foot at the proper angle.

From that moment it became possible for Mr. Marshall to resume newspaper work. The fact that his legs were paralyzed of course made it necessary for him to use crutches, but still—he got around very conveniently. How well this contrivance served him is shown by the fact that he was enabled by it to travel with no other companions than his secretary, whom he would have taken with him in any event. He dispensed with the services of the strong valet whom his drooping foot had for months made necessary. He went

nearly all over the United States on a lecturing tour and in the pursuit of his professional duties, and, in May, less than a year after he had been so terribly wounded, this broken-backed journalist sailed across the ocean and acted as the representative of the S. S. McClure Literary Syndicate at the Hague Peace Conference. His physical capacity to get around in this manner he was always will-



ing to acknowledge was due to Mr. Marks' happy thought of "putting his foot in a sling."

After Mr. Marshall's return to America the condition of his left leg became steadily worse, and finally, after gangrene had set in and had done its deadly work, amputation of the leg at about the calf was performed. The tissues of the stump were, of course, paralyzed, and the doctors said they did not believe Mr. Marshall would be able to wear an artificial leg in less than a year. Indeed, it was predicted that he would be in the hospital for at least three months as the result of the complication. The same vitality which had enabled him to live through his terrible Cuban experience, pulled him through again, and he returned to his desk at the offices of the S. S. McClure Company within three weeks. Not more than six weeks later Mr. Marshall stopped in to see Mr. Marks, the man who had "put his foot in a sling." Mr. Marks thoroughly understood the fact that to put an artificial leg on a paralyzed stump is a ticklish thing to do, for the paralyzed tissues, being without sensation, give no warning to their owner if injury occurred to the stump. He volunteered the belief, however, that he could make an artificial limb which should be so carefully adjusted and fitting so perfectly that there could be no possibility of injury. After consultation, Dr. Cyrus Edson, who was Mr. Marshall's physician, advised a trial.

It took Mr. Marks exactly one week to complete the artificial

limb. Marshall tried it and found it to fit perfectly. Again he was able to go about. Again he was able to get along without the arms of an attendant always at his shoulders. It must be understood that the partially paralyzed condition of his other, or right leg, had made it impossible for him to walk with two crutches after the amputation. He had used a crutch on his left side, but he had to be supported by an attendant on his right side.

Since the day that Mr. Marshall put on his artificial leg, no man has been more actively engaged in journalistic work—and certainly no field of human endeavor requires greater physical activity. He became Sunday editor of the New York *Herald* in a few weeks, and

has, since leaving that post, engaged in many enterprises involving much traveling and physical activity.

Following is a letter which he wrote Mr. Marks not long ago without solicitation:

My Dear Mr. Marks:

I am going away for a time and shall need some supplies. I cannot tell you what a comfort that artificial limb has been to me. You know that my right leg is still paralyzed from the knee down, and that it is still somewhat beyond my control. Such is not the case, however, with the leg made by you. I can handle it almost as well as I handle the one God made for me, and I am afraid that I make it do far more than its fair share of work. Sometimes I almost wish that it may be necessary to amputate the right leg, as I can certainly handle the left one much better than I can the one which is still flesh and blood. Very sincerely yours,

EDWARD MARSHALL.

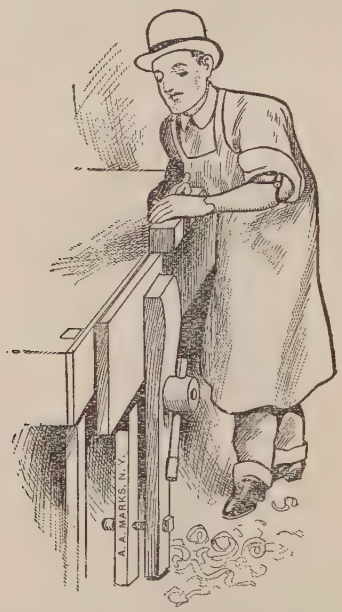
The difficulties that were present in Mr. Marshall's case were the partial paralysis of the motor nerves and the total paralysis of the

sensory nerves, resulting in the absence of sensation in the stump and a complication of infirmities in the opposite leg.

The artificial leg made for him was constructed upon the model of cut E 17, illustrated above. This model has a rubber foot and is suitable for short and long stumps, as well as those of medium length, as shown in the accompanying cuts.

*CALVIN MARSHALL—Carpenter, Lamar Co., Tex. Below elbow.

I take pleasure in testifying to the satisfaction I have derived



from your artificial arm with rubber hand, my arm being amputated about midway between the wrist and elbow.

I am a carpenter, and can do as much work as ever. Can use my planes and drawing knife to perfection. Feb. 1, 1902.

C. S. MARSHALL, M. D.—Nova Scotia, Canada.

I thoroughly believe the Marks' make of limbs with rubber hands and feet is superior to any other make.

The leg purchased by me for Miss Aggie Holland is giving good satisfaction. I can heartily recommend the Marks' make of artificial limbs.

J. W. MARSHALL—Office Work, Lauderdale Co., Miss. Below knee.

I have worn one of your artificial legs nearly five years and find it gives satisfaction in every particular. I lost my leg in May, 1899, amputation six inches below the knee which left my limb very sensitive in front but this sensitive place is fully protected by your leg. I would not wear any other leg. My position is that of check clerk and this keeps me on my feet from morning till night. May 4, 1904.

* E. T. MARTIN—Chile, S. A. Below knee.

The fit is perfect and my son is able to use the leg with the greatest comfort.

My son begs me to tender you his most earnest and heartfelt thanks for the blessing that you have been the means of rendering to him.

* ELIAS W. MARTIN—Harness Maker, Lancaster Co., Pa.

I have been wearing an artificial leg for the past six years. First I used a cheap one. That was not very satisfactory and people would hear me coming a mile away. I then bought from two other houses but both were unsatisfactory. In 1903 I got a leg from you and must say that I like this one better than all the rest together. I am a sound boy again, and a harness maker by trade. May, 1904.

H. R. MARTIN—Attorney, Wayne Co., Mich. Above elbow.

The artificial arm you made for me last November has given entire satisfaction. I have worn it every day since I received it, and it has caused me no discomfort whatever. The mental comfort and satisfaction which I feel in wearing it, amply justifies me in advising others to procure an artificial arm without delay from A. A. Marks. May 21, 1904.

* JESSE MARTIN—Farmer, Age 72, Richland Co., Ohio.

I am now wearing my second artificial limb of your make, it gives perfect satisfaction for strength, durability, action and utility, the same as the first one. May 3, 1904.

J. S. MARTIN, M. D.—Union Co., N. J. Both below knees.

Having for the last eleven years used in my practice Marks' Patent Artificial Limbs, with India-rubber attachments, I feel it my privilege as well as duty to acknowledge my favorable appreciation of them.

Several of the cases have been under my daily observation, while in pursuance of their various avocations, the majority being employees of the Central Railroad of New Jersey, with which I have been a long time connected as surgeon. I will only mention a single case, that of Patrick Liddy, of this place, who was supplied with a pair of legs, and he does a considerable amount of walking, and usually without cane, regarding it as an incumbrance.

I may, if desired, by consent of the parties, refer to others having lost one leg who succeed in their natural desire to escape observation; another remark is due, that the India-rubber foot does *not* produce that wooden-leg sound so often noticed on the street from *less* modern appliances. I have not yet heard a patient express dissatisfaction, and feel well sustained by experience in giving this approval.

* JOSE DE LA LUZ MARIN—Tailor, Mexico. Below knee.

The artificial leg you made for me has been very successful, as I walk with almost the same security as I did with the natural one.

I am a tailor by occupation and take the measurements of persons whose clothes I make with every ease and no discomfort whatever, as I make all the movements necessary with the artificial leg. I am very much pleased with it and recommend everyone who, like myself, has had the misfortune to be crippled to procure the limbs they require of you.—Translated from Spanish.

FRANK I. MASON—Traveling-man, Polk Co., Iowa. Below knee.

I have been wearing one of your artificial limbs for two years, and it has given entire satisfaction. My amputation is six inches below knee and my stump is in good condition. May 16, 1904.

CAMPO E. MATEUS—Student, Hampden Co., Mass. Above knee.

Having had the misfortune to lose a leg during the last civil war in Colombia, S. A., I have been using one of your artificial legs for one year. Indeed I will tell you that I am very much pleased with it. I am studying in Mr. Pitkin's school of languages, Springfield, Mass., and I walk and play with the boys the same as before I lost the leg. I walk without cane because I don't need it. I have written to some of my friends who have lost legs in the same war, recommending your house as the best. May 6, 1904.

L. J. MATSON—Livery, Sumner Co., Kansas. Above knee.

My leg is amputated above the knee. In 1896 I went to your office and got one of your legs and was well satisfied with it.

I wore it six years, and in the fall of 1902 I went to your office and got another leg and am more than pleased with it, it is better if possible than the first. I am in the livery and feed business and get around and handle horses all right. Your limbs can't be praised too highly. May 20, 1904.

* MR. L. MAUER—Judge, Germany. Above knee.

While at the University from 1870-1872, I suffered the amputation of my left thigh, the nerves and end of bone were insufficiently covered. Until 1894 I used the product of a local firm, which was made of leather and steel, weighing some six kilograms, with knee and ankle joints. The weight and clumsiness of this machine made it a heavy burden. This annoyance was ended by your leg. I received two from 1894-1896, which I hope to use for many years. I have never seen a better limb. The simplicity and durability of its construction recommend your limb and I repeat my sincere thanks to you.—Translated from German. May 3, 1904.

* MISS GRACE MAYNARD—Worcester Co., Mass. Ankle joint.

The leg I got from you is all right. I have used it since 1896. Mine is an ankle-joint amputation, my work is on a farm raising vegetables which requires me to be on my feet all the time. I can get around as well as those that have their own feet and without walking lame. People that don't know of my accident won't believe I wear an artificial limb. May 7, 1904.

* JOSEPH MAYO—Well Digger, Goochland Co., Va. Above knee.

The artificial leg I bought of A. A. Marks is and has been very satisfactory, and I feel that I could not do without it. I would not take a thousand dollars for the leg if I could not get another of your make. June 12, 1904.

EDMUND MAZUREK—Coal Dealer, Queens Co., N. Y. Below knee.

My leg was amputated below the knee. I got my leg in 1897 of you, and I feel very well satisfied. I work every day on the wagon. The new one is better than the old one, and the old one was as good as anyone ought to ask for. May 19, 1904

* JOHN MEIGS—Coal Miner, Choctaw Nation, Indian Territory.

The artificial limb you furnished me sometime ago I am well pleased with, it has given perfect satisfaction, it hasn't caused me any trouble whatever. My right arm was amputated in May, 1902, about eight inches below the elbow. My occupation is a coal miner. I don't know what in the world I could do if I didn't have this artificial arm. I have done work that I never thought I could do. I dig coal with men who have both hands and I draw as much as they do. I find that it is a help to me in all my undertakings. May 5, 1904.

* TONY MELETALLO—Chautauqua Co., N. Y. Above elbow.

I am well pleased with artificial arm. It fits nicely, works easily, and I can use it to advantage. May 10, 1904.

* M. G. MELL—Grain Dealer, Woods Co., Okla. Ankle joint.

I don't know how to express my gratitude to you for the good you have done me in making my artificial foot. A foot without fault.

I am in the grain and live stock business and can get around and do anything that a person can do who has both feet.

I have lived in this town over two years and very few know that I wear an artificial foot. My testimonial cannot be too strong in recommending the A. A. Marks' artificial feet. May 5, 1904.

* U. E. MAST—Druggist, Lagrange Co., Indiana. Below knee.

I purchased my first artificial leg from you about thirteen years ago and wore it every day for twelve years. My only expense in that time time for repairs was $1.88. In January, 1903, I purchased my second limb of you which I have worn every day since without

one cent of repairs or expense. My business is druggist and jeweler and I do a great deal of walking. I can easily carry two large pails of water up or downstairs, spade my garden, split wood, climb a ladder, carrying fifty pounds on my shoulder. In fact I can do nearly any kind of work. The Marks' limb is the best I have ever seen. May 18, 1904.

J. W. MERSHON—Undertaker, Lackawanna Co., Pa. Below knee.

The leg I got of you eighten months ago is all right. I never have any trouble with it. I have worn your legs for thirty-five years and always with comfort and satisfaction. I wore one ten years with no repairs to speak of. I have worked ten hours a day for years making furniture and undertaking. Marks' leg is the best in the world. May 14, 1904.

J. W. METCALF, M. D.—Brooklyn, N. Y.

Refer to me as to the merits of the Marks' limbs.

MRS. F. J. MICHAUD—Quebec. Shortened leg.

My daughter, when a child, was afflicted with hip-joint disease which left one leg shorter than the other.

The shoe which you arranged for her has made walking much easier and less tiresome. She walks with scarcely a perceptible limp.

A. MICHELSON—Contractor. New York, N. Y. Below knee.

The limb you made for me answers in a very satisfactory manner. My business as contracting yacht and steamship painter necessitates my doing considerable running about, and climbing aboard vessels of various heights, also in and out, and up and down drydocks, marine railways, and pontoons, which are usually covered with slime, making it very slippery.

My customers, which largely consist of the wealthy merchants,

bankers, and prominent men, often comment on how I use the limb to advantage. May 5, 1904.

B. J. MILAM, M. D.—Macon Co., Mo.

The artificial leg you made for Mrs. Geiselman in June, 1894, has done her good service. She wears the leg every day, and does all her own housework. She says she would not take $1,000 and do without it. She is well pleased in every respect.

* N. MILDENSTEIN—Lubeck, Germany. Below elbow.

In regard to the artificial hand I got of you nine years ago, I can say it exceeds my expectations.

If I were compelled to work for my living the rubber hand would be of great use in any occupation. I recommend the rubber limbs to anyone who has had the misfortune to become crippled.

A. MILLER—Machinist, Oneida, Co., N. Y. Below knee.

Several years ago my foot was amputated just above the ankle. I tried different limbs with ankle movement, and found them unsatisfactory. Have worn one of your artificial limbs for eight years, and am still wearing it with comfort and satisfaction. My occupation is one in which I am obliged to do a great deal of walking. June 3, 1904.

* FRANK MILLER—Driver, Cook Co., Ill. Above knee.

I had my leg amputated in 1883 on account of disease. In September, 1891, I ordered an artificial leg from you, you made it from measurement I had made at home and sent to you. The leg was received promptly, and fitted acceptably, I wore it continuously for twelve years, during which time it did a great amount of hard work, and I walked long distances. I was so well pleased with the leg that in April, 1903, I ordered another of you, which I am now wearing in the most satisfactory way. June 4, 1904.

* LON MILLER—Ohio Co., Ky. Son Guy, age 12. Below knee.

My son has been wearing an artificial foot of your make since August, 1901. It has given perfect satisfaction, and a great many people can't tell he has an artificial foot. He wears short pants yet. We are glad we got one of your make. July 17, 1904.

LOUIS MINET—New York City, N. Y. Ankle.

I am very well pleased with the foot I got from you for my son, Willie, when six years old, and find it very complete and satisfactory. The boy enjoys play with it like the rest of the boys.

* PEROSHAW B. R. MODY—Manager, India. Below elbow.

It affords me great pleasure to add my testimonial to the long list you already have.

In June, 1902, I had the misfortune to lose my left arm three inches below the elbow, on account of blood poisoning. Shortly after I forwarded to you the measurements for one of your artificial arms, which arrived in due time, and which I am wearing regularly since, and am glad to say has given me great comfort and satisfaction.

My occupation is that of manager of a joint stock company, and I find the arm a great help in my duties. Oct. 12, 1904.

GEORGE MOEHN—Plumber, Brooklyn, N. Y. Above knee.

In the year 1901 I fractured my leg, and had it amputated. I have two friends with Marks' legs who surprised me by their good walking. This caused me to have Marks make me one, five weeks after the amputation. I am satisfied that I could not have done better. My stump is only six inches long, and my friends are surprised when they see me walking along the streets. May 5, 1904.

* LOUIS MOHLFELDT—Farmer, Lewis Co., Mo. Above knee.

I desire to state that your artificial limbs are what they are rep-

resented. Have had two of them, and consider them the best. Would recommend anyone wishing a limb to use yours. May 17, 1904.

* LAWRENCE A. MOLTANE—Bookkeeper, El Paso Co., Tex. Ankle.

My artificial limb is giving every satisfaction that could possibly be obtained from an artificial limb. I am taking dancing lessons, and my teacher thinks I am making great progress. May 24, 1905.

* RIGOBERTO A. MONDACA—Chile. Below knee.

I have used your leg, and it gives me great pleasure to inform you that it was a great success from the first moment. I have been able to walk, run, and mount a horse with the greatest ease. I therefore tender you my thanks for the great success in my case. Your artificial leg enables me to transact all my business without feeling the loss of my natural limb.

JOHN MATTHEWS—Street Sweeper, Westchester Co., N. Y.

I bought an artificial leg of you in 1866, I wore the same until 1888, then I obtained a new one which I am now wearing. Two artificial limbs in forty years with practically no repairs, certainly

reflects credit to the work that you do. I have always been a general utility man, have scraped the streets, shoveled, used a pick-ax, blasted rock, and carried articles of heavy weight, in fact have always been occupied with a kind of work that would put the artificial limb to the severest tests. You are at liberty to refer to me. April 11, 1905.

* ARTHUR MOORE—Tinsmith, New Zealand. Below knee.

The leg I received from you is giving me great satisfaction. It is amputated below the knee. I find I can get about well, I walk two miles every morning and return at night. I go out at night without feeling the least exhaustion. I am a tinsmith by trade, and work without trouble. June 8, 1904.

* FRANCIS M. MOORE—Farmer, Ford Co., Kas. Above knee.

On the 18th of last September I received the artificial leg that I ordered from measurements, to take the place of the limb I lost

on account of varicose veins in 1889, you will thus see that fourteen years elapsed since the amputation and the application of an artificial leg. I get around very well, my only regret is that I did not get the leg long before. Going about so many years on crutches got me into habits, and a peculiar way of carrying my stump that has occasioned me some little trouble, which, however, is disappearing gradually. If I had obtained my leg six months after the amputation I am sure I would to-day be walking as well as any person in possession of their natural legs. As it is, I would not take anything for the artificial leg, it is a source of great comfort, relief, and help to me. May 17, 1904.

GLENN DE LLOYD MOORE—Railroad, Montgomery Co., Pa.

I suffered the loss of my leg on Nov. 13, 1900, while employed on the Pennsylvania R. R., and after recovering I obtained an artificial leg with movable ankle joint.

The great trouble with it was the necessity of constantly having the spring renewed and joint oiled, and frequently taken apart and overhauled. There is also a constant jar and metallic clash, sounding something like a locomotive running with the side connections loose, this was very unpleasant to say the least. In your leg this is entirely obviated.

I frequently ride on engines and freight cars, at times assisting in firing, and I have no hesitation in getting on and off while the trains are moving.

With your leg I have no difficulty in walking over unknown ground at night. With the movable wooden foot a person has not this confidence, as there exists a condition approaching that of locomotor ataxia, namely, the lack of control of the foot by the power of the will, which is not felt in the leg possessing the rubber foot. May 20, 1904.

* HUGH MORAN—Locomotive Engineer, Chester Co., Pa. Instep.

The artificial foot you made for me one year ago has given perfect satisfaction, and also the one you made previous, which I wore ten years. My occupation is a locomotive engineer, I work from ten to fifteen hours a day, and am on my feet all that time, and think nothing of walking several miles after my day's work. I have been out walking with young men with sound limbs, and they would tell me not to walk so fast. I have worked with men for months who never knew there was anything wrong with my foot. I think the Marks' limb one of the greatest boons to unfortunate humanity that exists. May 17, 1904.

* FRANCISCO SOLERNO MOREIRA—Soldier, Brazil. Below knee.

In 1897, as ensign of the 39th battalion of infantry of the Invincible Brazilian Army, composed of heroes and giants, I received a bullet wound in the joint of my right foot in battle, which necessitated the amputation of the leg a little below the knee. I had no thought or hope of a further military career. I graduated from the military school at Ocara, with every promise of a successful and brilliant career, but alas, the injury I received in the battle shattered my hopes, and left me almost without ambition. In my most bitter moments of depression, I chanced to get possession of your descriptive catalogue. After looking it over very carefully, I procured from you an artificial leg. I have had it now five years. I walk with such perfection that only my most intimate friends, those who are acquainted with my affliction, know that one of my limbs is artificial. My good friend and illustrious benefactor of suffering humanity, accept my thanks for the perfection of the apparatus you have given me, which has permitted me to resume the military duties which I so love. Of the various limbs which I have seen, French, German, and English, those of your make are the most perfect.—Translated from Portuguese. July 10, 1904

THE ARMENIAN MASSACRE—An artificial leg sold into captivity.

It seems to be the strange order of things that, periodically the world is to witness scenes of exceptional horror. Christians are fed to lions in the Colosseum; or in shirts of tar, burned like candles to illuminate the gardens of a Roman Emperor. A French Revolu-

tion with its guillotine and "days of terror" deluges a land in blood; and, in our own day, in the full blaze of the nineteenth century, the most shocking of all appears in the Armenian massacres.

For six hundred years the Armenians were the most submissive servants of the Ottoman Empire, and the most prosperous of the

non-Mohammedan races, Christians and Jews, who paid tribute as a penalty for not accepting Islam.

The accession of the present Sultan marked a change in their condition. He had not been long on the throne before a constantly increasing series of oppressions were begun.

The reason for this course of action is not hard to seek.

Sultan Abdul Hamid lost Bulgaria, a valuable part of his dominion, because of its prosperity and spread of European ideas of liberty, and European civilization among the people. Fearing he would lose Armenia also, if it became as enlightened as Bulgaria; and, giving "fear of rebellion" as an excuse, he entered on that course of persecution beginning with a merciless taxation, and ending with the slaughter of more than 30,000 persons, under circumstances of incredible horror..

Among those who, while escaping with life, "suffered the loss of all things," is a native missionary, the Rev. Kevork Muncherian.

Having lost his right leg by reason of a snake bite, he managed to get about on a peg leg of local manufacture for a number of years, when through the kindness of a brother missionary, he procured an artificial leg from A. A. Marks, of New York, which he used with great comfort and assistance in his missionary labors.

Mr. Muncherian writes:

"The leg which I got from you nine years ago was very satisfactory, and I wore it with comfort for seven years, but during the massacre two years ago my house was burned, and all my possessions carried off by the Turkish soldiers.

"Among other things, they took my artificial leg, and sold it into captivity. Since that time, after having been saved from death in a wonderful way, I have been obliged to use my old wooden peg leg.

"Although I am a native of Marash, Turkey, for ten years I had been living and engaged in business in the small town of Anderin, preaching the Christian gospel in a little church on Sundays, and occupying my spare moments in the interest of the Christian faith. At the time of the massacre my wife and children were in Marash, while I was in Anderin. The greater number of the inhabitants of Anderin are Moslems. At the time of the massacre I had 50 liras

($220) worth of goods in my shop, and 100 liras ($440) worth of wheat, barley, corn, and other grains. All of these were carried off by Moslem robbers in the course of a few days; on several occasions I barely escaped death. Suddenly one day without any warning a company of Armenians from Zeitoon, having tired of Turkish op-

pression anl tyranny, made an attack on the town, and after a short but sharp contest took possession, and proceeded to plunder the houses of the Moslems, and to kill all the Turks they could lay their hands on.

"In that terrible scene, the way in which I was saved was wonder-

ful; when I came out from my place of hiding those that caught sight of me mistook me for a Moslem and attempted to kill me, and I escaped only by crying out, 'I am a Christian, I am a Christian,' at the same time making the sign of the cross.

"I was in greatest danger when spied by a Gregorian monk. I

made the sign of the cross just in time to escape being pierced by a bullet which he was about to fire at me.

"The goods and grain I have already mentioned, and also the artificial leg I got from you, had been stolen by the Moslems.

"Having lost everything, saving only my life, I joined the Armenians when they were leaving the place, and that night, hungry, and destitute, I traveled a large part of the way on foot and peg leg to the village Geben, five hours distant. The third day after my arrival I happened to see my artificial leg, which the Armenians had brought with them. The Turks had thrown it away as a thing of no possible use, and so it had been picked up and brought to Geben by the Armenians. Just at this time the Osmanli army attacked Geben, and I was forced to flee to Zeitoon; my journey lasted fifteen hours, and was through a wild, mountainous country. I had to walk most of the way on my antiquated peg leg; the

journey would not have been half as arduous if I had had my artificial leg instead of this crude peg affair.

"According to investigations I made afterwards, the leg I left in Geben was captured by the Osmanli soldiers, and sent as a prisoner to the headquarters of the army corps, and there sold and held into captivity.

"A few days after my arrival in Zeitoon, the Turkish army made an attack on the town. On the third day of the conflict I climbed up a steep mountain and hid in a cave, sheltered by a great rock. I stayed in this cave without food or water for three days and nights, after which I went back to Zeitoon. There I got on a horse with the intention of riding up to the Turkish lines to see if I could get through to Marash, to my home and family; but no sooner had I set out from the town (two miles from the Turkish lines) than the Turkish soldiers began to rain bullets on me. I succeeded in reaching the outworks of the defences of Zeitoon, but could go no further, so I turned back to re-enter Zeitoon, still under a murderous fire, but praise God not one of the bullets hit me. I was obliged to remain about three months in besieged Zeitoon, in the midst of a terrible and continuous batle—without a cent, hungry,

and in great sorrow and fear. Finally, through the mediation of the great powers the war ceased, Zeitoon was saved, and I returned to my native city, Marash. As soon as I reached the site of my home I found that during my absence one of my little girls had been killed, all my household furniture was stolen, and my house burned down.

"Since those terrible times I have been working in this and surrounding villages, under the direction of missionaries of the Ameri-

can Board, as a relief agent and preacher, at a salary of $5.28 a month, while my wife is engaged in Marash at a salary of $3.52; you will thus see that we have to live in a most economical and exceedingly uncomfortable way. I hope to receive my new leg, when I will be in better shape to work and travel.

"Yours sincerely,

"KEVORK MUNCHERIAN,

"Armenian Missionary."

* F. MORGADO—Machinist, Vera Cruz, Mexico. Below knee.

It is with pleasure I inform you that the artificial leg I ordered of you last May for Alberto Paredes, amputation below the knee, for which I took and sent you measurements and diagrams, has been received and worn with perfect satisfaction. The limb is so perfect and well finished that in less than ten days after putting it on Mr. Paredes returned to his work, the same that he was engaged in before amputation. The work is very hard, as he is foreman of the loading of steamers in the bay. Every time Paredes meets me he repeats his gratitude for having told him about your house. He says that the only way he could be improved is to have his natural leg back again. The leg you made and sent to him fits perfectly.

In regard to the artificial leg you made for me two years ago, I take pleasure in saying that I use it constantly. I am also engaged in hard work, I am a machinist. The leg will undoubtedly last many years longer. In regard to perfection and workmanship, I sent a voluntary testimonial some months ago, and the thought expressed in the same is repeated now.—Translated from Spanish.

August 5, 1904.

*J. H. MORGAN—Laborer, Columbia Co., Ga. Below knee.

I am now using my second artificial limb purchased from you. I was working in the R. R yard at Waycross, Ga., when the accident happened which necessitated the amputation of my left foot, about midway between knee and ankle. I commenced using my first artificial limb in December, 1896, using it continuously until February, 1904. I am now using my second limb with entire satisfaction, it fits perfectly, even better than the first. I can see no room for improvement. June 13, 1904.

* EDWARD MORRIS—Oneida Co., N. Y. Above knee.

I have worn your leg ever since I received it, and am getting on very fine. Results most gratifying. May 24, 1904.

* H. C. MORRIS—St. Johns, Newfoundland. Above knee.

I will appreciate the favor of your permission to grant me space in the new book you are about to publish, to contribute my testimonial to the superiority of the artificial limbs manufactured by your firm.

For almost thirty years I have worn artificial legs constructed by you; during that period they have been subject to repairs and alterations, but these were made because of changes in my stump. In my earlier days I used a leg made by a London firm, also one made by an Edinburg manufacturer. My personal experience, and that of scores of patients, belonging to Newfoundland, both male and female, for whom I have taken measurements for arms, legs, and appliances, is that for durability, comfort, and gracefulness of movement, nothing can come up to the standard of superiority reached by the limbs constructed by you. May 2, 1904.

[N. B.—Mr. Morris is competent to take measurements and attend to the details of ordering, receiving, and adjusting artificial limbs; any person in need can place himself under his attention with the assurance of receiving proper care.—A. A. M.]

S. A. MORROW—Railroad, Blair Co., Pa. Two fractured kneecaps.

I am wearing your braces for two fractured kneecaps, and they are giving entire satisfaction. Can get along without crutches or cane. My occupation is a car oil man, or inspector, I can go to the top of a pair of step ladders quite easy, which I could not do without the braces. May 19, 1904.

* R. D. MOTHERSILL—Carpenter, Jamaica, W. I. Below knee.

I have worn one of Marks' artificial legs with rubber foot for eleven years, and must accord to him all the merits in the line of the manufacturing of artificial limbs, its durability, its ease, and simplicity.

I take my usual pleasure in sporting, going over hills and dales without the sign of fatigue or inconvenience.

I am a carpenter, and do a large amount of walking, and my artificial leg has a great deal of wear and tear.

CHARLES M. MOTT—Driver, Queens Co., N. Y. Below knee.

I am driving a wagon every day, and I wear the leg sometimes forty-eight hours. I have no difficulty in walking or getting about. This is the third artificial leg you have made for me. The first was bought when I was a boy. You have greatly improved in your work in the last number of years, as each leg has been better than the former one. I can recommend your limb to anyone that needs one, and believe your legs cannot be beat. May 24, 1904.

* FRED. MOWBRAY—Schoolboy, New Zealand. Above knee.

About twelve months ago I met with an accident which necessitated my right leg being amputated above the knee. It is now about five months since I used your artificial limb, and can get about with great ease, in fact, after the first fortnight I could walk without the aid of a stick.

I still go to school, and can mix in many of the games, such as cricket and marbles.

I was in Dunedin a short time ago, and found no difficulty in getting on and off the electric cars, climb a ladder, go up and down stairs, in fact, there is very little that I cannot do. July 1, 1904.

PERLEY N. MUDGETT—Farmer, Lamoille Co., Vt. Above knee.

My artificial leg works nicely. It enables me to get about my farm, and do considerable work. It is much better than the one I had with an ankle joint, it is easier for the stump and more comfortable in walking. June 29, 1904.

JOAQUIN RICALO MUGUERCIA—Cuba. Knee bearing.

Gratitude is one of the noblest sentiments of the human heart. My duty is not only to express my gratitude to you, but to pay a tribute of justice to merit.

Every day I am more thankful for the leg of your manufacture which I am using.—Translated from Spanish.

* MRS. MUIRS—Fremont Co., Colo. Daughter. Below knee.

The artificial leg you made for my daughter, Lizzie, last September, fits fine, and gives her no trouble. It was only the other day that her teacher found out she wore an artificial limb. She goes to school every day, and joins in all outdoor exercises the same as other pupils. May 1, 1904.

JOHN MULLEN—Tanner, Lycoming Co., Pa. Knee.

I have worn one of your artificial legs for nine years. It has given perfect satisfaction. My stump is an end bearing one. I get around with ease. I can walk almost as well as ever. I think the rubber foot a complete success. My occupation is tannery man. It is hard work for anyone to stand, eight hours every day, but I have in five years never lost a day's work on account of being a cripple. June 4, 1904.

* DUNCAN MUNROE—Clerk, New Zealand. Above elbow.

On August 1, 1902, I met with a railway accident, resulting in the loss of my left arm, just below the shoulder joint. In the following August I was wearing one of your artificial arms, which I have been wearing every day. I don't think the arm could have fitted better if I had been on your premises. I feel it my duty to congratulate you on the able manner in which you have done the work from the Rev. Cox's measurements. At the time of the accident I was a locomotive fireman, and being disabled I took up clerical work, which I am at at the present time, and I manage it without the slightest difficulty.

I find my arm of great service in a great many ways, and the longer I wear it the more useful it gets. I do not hesitate in recommending your artificial limbs. May 26, 1904.

* WILLIAM MURDOCK—New Zealand. Above knee.

Seventeen years ago my leg was amputated above the knee, and I got an artificial leg. It did not turn out suitable, so ten years ago I forwarded measurements to you for one of your legs. I am glad to say this has proved in every way satisfactory. The rubber foot with spring mattress in particular being very comfortable—there not being the slightest jar when walking. I am a tobacconist and newspaper vender. The latter occupation necessitates my walking a three-hour round every day, besides being on my feet the remainder of the day.

* J. H. MURPHY—Barber, Taylor Co., W. Va. Above knee.

Your leg has given me the best of satisfaction in all particulars. It is complete in every respect. Better satisfaction could not be found. I am a barber, and work from fourteen to eighteen hours daily. June 12, 1904.

* A. W. MYERS—Teacher, Lee Co., Va. Below knee.

With pleasure I endorse your rubber foot. My leg is amputated below the knee, and I have worn one of your artificial limbs over a year.

I was fitted from measurements, and I find the leg to be in every particular what you represented. I am a teacher, and am on my feet a great deal. I can run, jump, and skip almost as if I had two natural feet.

I have walked as high as ten miles in a day. I have not had to pay out one cent for repairs. May 11, 1904.

FIRM MYERS—Druggist, Williamson Co., Ohio. Leg shortened.

I would like to write a few lines in regard to the extension shoe which you made for me. I have been wearing it for about eighteen months, and it has given good satisfaction. I am a drug clerk, and find no difficulty in performing my duties. My advice to anyone having a short limb would be to get one of your make.

May 17, 1904.

JNO. D. MYERS, M. D.—Cabell Co., W. Va.

I have used the "Marks' Artificial Legs" with rubber feet, and they give more complete satisfaction than any other I have ever seen. Have one case of double amputation (thigh and leg); the man walks with ease and comfort simply with a cane.

* W. H. MYERS—Teacher, Daviess Co., Ind. Above elbow.

I met with an accident in Oct., 1898, which caused the amputation of my right arm above the elbow. Life became a burden until Oct., 1902, when I received an artificial arm from A. A. Marks, which has relieved me of much embarrassment. June 6, 1904.

* ISMAEL NAVARRO—Republic of Colombia, S. A. Above knee.

I have for some time desired to write to you for the express purpose of informing you of my great satisfaction with the artificial leg you made for me, and now that the opportunity presents itself, I do so without delay. I have used it for three years without finding any defect. I shall always remain grateful to the estimable inventor.

* HENRY NAYLOR—Laborer, Lake Co., Cal. Below elbow.

I am the party that Dr. Fenn got the artificial arm and hand for. The arm is so much help to me I would not take double what it cost. In a very short time I will be as active as before amputation. I have only five inches of stump below the elbow. Dec. 21, 1904.

* J. G. NEELY—Age 16, Schoolboy, Davidson Co., Tenn.

I bought the leg I am now wearing of you about two years ago. I like it very much. I can get about very well on it. Can do almost anything I could before I lost my leg. May 12, 1904.

E. A. NELLIS—Sheriff, Litchfield Co., Conn. Below knee.

In 1864 I lost my leg by amputation below the knee. In 1865 I procured, as I supposed, one of the best artificial legs in use, the wearing of which gave me much pain, and I was often obliged to go back on crutches until the irritated and swollen stump was again in condition to wear the leg. It also annoyed me very much by frequent rattling at the ankle joint. Repair bills were from $6 to $8 a year. I was obliged to use a cane when walking. I wore this leg about two years. I met a great many wearing artificial legs made by various firms, all of whom were laboring under difficulties similar to my own. I think it was in 1867 or 1868, while in Watertown, N. Y., I met a gentleman wearing one of your artificial legs with rubber foot. I was surprised to see this man go up and downstairs actually on a run. He also moved about among the guests at the hotel noiselessly and quietly, with the grace and ease of natural motion; he advised me to get one of your artificial legs

with rubber foot. I at once wrote to you, requesting you to send me instructions and blanks for taking measurements.

I received a prompt reply, and ordered a leg. I have worn your legs constantly from the time I first received one, never having lost an hour's time from its use.

I go up and downstairs, up and downhill, through the brush, hunting and fishing. In fact, I go when and where I please with ease and comfort.

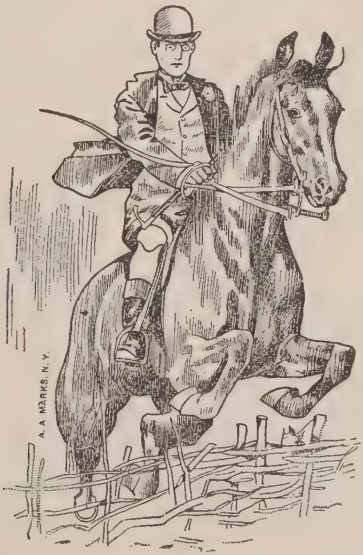
* NELS NELSON—Blacksmith, St. Croix Co., Wis. Above knee.

Having for the past eleven years worn one of your artificial limbs, and before that worn two others, I can say that Marks' is the best of them all. I would not wear a leg with ankle joint of any other make. Marks' rubber foot beats them all. I am a blacksmith by trade, and shoe horses. May 2, 1904.

* J. M. NICHOLSON—Teacher, Union Co., Ga. Above knee.

I lost my leg in the fall of 1900, and walked on crutches until July of last year. My stump was very tender, and for that reason I dreaded to have a limb adjusted. My doctor recommended your limbs to me, and said that although my stump was very tender, and easily irritated, I could use a Marks' artificial limb without pain or danger. Through his influence, and the persuasion of my friends, I placed my order for a leg with you.

When the leg came I adjusted it that evening and kept it on until



eight or nine o'clock. I put it on again next morning, and wore it the whole day, riding horseback seven or eight miles.

I again put it on and have not left it off from necessity an hour since. In six weeks I was going where I pleased without a staff.

I have walked seven miles over a rough north Georgia road in four and a half hours.

I am a teacher by profession, and suffer very little, if any, inconvenience in doing school room work. I spent the past five months in college and my classmates did not suspect that I was wearing an artificial limb. My limb is in fine condition, and I have not been out a cent for repairs. May 14, 1904.

IRA DEXTER NEVINS—Farmer, Hampden Co., Mass. Above knee.
I have worn your limb since 1896, and it has given me perfect satisfaction. I plow, harrow, and do all kinds of farm work with comparatively little trouble. Having had two of your limbs I recommend them as the best. May 18, 1904.

ROBERT NEWBERRY—Cooper, Brooklyn, N. Y. Below knee.
I have worn one of your artificial legs for two years with the greatest of satisfaction. I am 64 years old, a cooper by trade. I go about all the time, jump in and out of cars. It would surprise anyone to see me. May 22, 1904.

* GEO. M. NEWELL—Teacher, Middlesex Co., Conn.
About a year ago I obtained my second artificial leg from you. I thought the first was about as perfect a fit as possible, but this last is even more comfortable, and gives me no pain at all, it is eminently satisfactory in every way. I had a Symes' amputation, and a resection of the knee, so the leg reaches nearly to the hip. I expect to go to China next fall as a teacher for a five-year term, and do not hesitate at all on account of the leg. May 16, 1904.

* GEORGE NEWMAN—Barber, Chase Co., Kas. Ankle.
I was hurt some eight years ago, run over by railroad cars, which caused amputation at ankle joint of right leg. Have worn your artificial limb ever since, and am doing well. I don't think there is any other that can beat it. I have worn it with comfort, and strangers can't tell the difference, or which foot is off. I am a barber by trade, and have to be on my feet frequently half a night around my chair, and walk a mile every day from shop to home, besides that I ride horseback every day. Couldn't get along without your rubber foot. May 18, 1904.

R. J. NIDDRIE, M. D.—Ontario, Canada.
The artificial limb you sent for my patient, John Kiernan, works like a charm. We cannot say too much in its praise.

* ALEXANDER NOSEWORTHY—Fisherman, Newfoundland.
I had my leg amputated in February, 1902, and was getting about with great difficulty until I purchased one of your artificial legs, since then I get around with ease and comfort and I never use a stick and have never stumbled. I find the rubber foot and knee joint to work perfectly. I am a fisherman and can get about in a boat with very little difficulty. June 8, 1904.

* JOSE GERTRUDIS NUNEZ—Carpenter, Dominican Rep.
I have the pleasure of expressing my complete satisfaction with the artificial leg you made and sent to me in 1902. You will remember that I took the measurements myself with the assistance of a member of my family and sent them to you and you constructed the leg from them.

I recently made a trip to the City of San Domingo, to compare my artificial leg with those of other manufactures. I met several persons, when we compared notes, I assure you they felt much sadder than I, they saw in me an agile person operating on an artificial leg, while they were only able to get about in a very clumsy way. I took pleasure in acquainting them with your location and the work that you were able to do for their relief. I have no doubt that you will hear from them. I distributed all the books and cards that I had of your establishment, and regret that I did not have more.

My occupation is that of a carpenter, and I do work in all departments of that trade.

After leaving the capital I arrived at Port Azua, disembarked, not seeing any conveyance I immediately left on foot, the distance to the town is about two leagues. I think I arrived at the town in

less than an hour without stopping the whole way. In four days I boarded a locomotive arriving at the plantation of Bichine successors. I returned on foot; it rained the whole way, but my limb received no damage.—Translated from Spanish. June 1, 1904.

W. C. NUSS—Clerk, Bradford Co., Pa. Below knee.

At the age of twelve I had the misfortune of losing my right leg, amputation below the knee; when twenty-one years old I purchased an artificial leg with rubber foot from you and wore it continuously for sixteen years with the best of satisfaction.

About two years ago I purchased another from you which is giving satisfaction in every respect. I am employed as clerk in the L. V. R. R. Co's. store department and have no difficulty whatever in performing my duties. I play a horn with the band of this place and have been on some long parades and always come out right side up. May 2, 1904.

T. J. O'CONNELL—Bartender, Washington, D. C. Below knee.

I have been using your legs since 1871, they have never given me any trouble. I have been attending bar all those years and have done as well as my partner with his natural legs. May 10, 1904.

* W. W. O'NEAL—Farmer, Rapides Co., Louisiana. Below knee.

I am perfectly satisfied with the service rendered me by the leg as I do as much work and walking as I ever did. June 10, 1904.

PATSY OATES—Machinist, Stevens Co., Wash. Ankle joint.

My new foot is all right. My amputation is in the ankle joint and I bear my whole weight upon the end of the stump. I run all kinds of quarry machines and do other kinds of work at the quarry. The Stone Cutter Co., of Rutland, Vt., send me all over the country to set up machinery. If I were not able to do the work they certainly would not send me three thousand miles from home. I am working with men who do not know I have an artificial foot. I want to come in contact with someone who wears a foot of some other make and does as well as I do. May 2, 1904.

* A. OGLESBEE—Screven Co., Georgia. Right arm above elbow.

It gives me great pleasure to add my testimonial to the long list of those who are using your artificial limbs. Two years ago I had the misfortune to have my right arm cut off above the elbow in a cotton gin. When I sent for an arm I had very little faith in my ability to use it. However, since I have worn your arm I find myself able to perform nearly all the work that is necessary to be done on the farm. I can drive, plow, or hoe, with very little inconvenience, and I certainly consider that in my case your limb has been a God-send. May 13, 1904.

HARRY P. OSBORN—Stenographer, Essex Co., N. J. Below knee.

I have been wearing legs made by you for over twelve years and would wear no other as no other leg would give satisfaction.

Both of my feet were deformed from birth. At the age of eight years it became necessary to amputate my right foot about six inches above the ankle. A few months later I received one of your legs and have never missed a day wearing it from early morning until late at night.

I am in no way handicapped by my affliction. I am employed in New York as stenographer and walk a distance of over two miles to the office each day. I often take a five mile walk for pleasure. June 2, 1904.

MILDA OSBORN—Passaic Co., N. J. Below knee.

I purchased my artificial limb from you nine years ago. It has done good service and only been repaired once in that time. May 28, 1904.

V. C. OVERTON, M. D.—Jefferson Co., Tex.

I received the artificial limb belonging to Fred Bailey, and delivered it to him. He just simply walked out of my office and down the stairs, a new man and more than satisfied. He joins me in extending you thanks for your skillful and accurate work.

* H. PACKER—Laborer and Farmer, New Zealand. Below knee.

I received the leg and am very well satisfied with it. I can get about splendidly. I do almost the same sort of work I used to do.

When I lost my leg I never thought I would be able to get about very well again, but I find that I can get about as well as ever I could. All my friends tell me that I have gotten on wonderfully well. I have had every satisfaction and I think I have given it a good trial as I have had it for two years and have done some very rough work in a very rough country. I build fences, cut firewood, and work in the gravel pit, and also shear sheep. June 14, 1904.

* B. F. PAGE, M. D.—Grafton Co., N. H.

The legs bought of A. A. Marks for my patients were entirely satisfactory.

* WALTER PAINTER—Montgomery Co., Pa. Right below knee.

I hereby express my continued satisfaction with the artificial leg you made for me. I walk very well without a cane or any other support and without your patent rubber foot my life would be miserable. I could not walk on crutches very well, but now nobody can detect that I am wearing an artificial leg. As soon as I received the leg, I put it on and have worn it ever since. It gives so much satisfaction that I would not part with it for any consideration. May 9, 1904.

* LESLIE PALMER—Clerk, Franklin Co., Me. Above knee.

In December, 1902, I received the artificial leg you made for me, it was just seven weeks after the amputation. I applied the leg

the day it arrived, and it has not been off my stump since except at night. I am able to dance, which I enjoy very much. I do not use a cane, and have walked five miles on one stretch. The

limb has been perfectly satisfactory, and I am able to stand the strain of an athletic life in Maine with great enjoyment, such as hunting, brook fishing, and mountain climbing. May 9, 1904.

* RICHARD M. PALMER—Coal, Knox Co., Tenn. Above elbow.
I have worn one of your artificial arms, for sixteen months, which cost me $75, and I would not take three times what I paid for it. It has given me so much comfort that I would not part with it. I can use the reins in the hand, and carry my fifty pound grip easily. I find it satisfactory in every way. October, 1904.

* A. F. PANKNIN, M. D.—Charleston Co., S. C.
The pair of artificial legs you made for Mr. Grooms some years ago have suited him admirably. He paid me a visit about a month ago, walking all the distance (about a mile) with only the aid of a cane. I don't think he could have had a more satisfactory fit. You made the legs from measurements that I sent you, and Grooms did not leave his home.

* WILBUR PARKS—Broome Co., N. Y. Below knee.
I will say that your artificial feet are all right. I have not undertaken to do a thing that I have not made a success of. I am a farmer, and can plow, harrow, and do all kinds of farm labor, and can ride a bicycle as well. My foot was amputated above the ankle, and was never of the best, but with the aid of your artificial foot I am getting along practically the same as before it was amputated. May 18, 1904.

* MRS. MILDRED M. PARLIN—Kennebec Co., Me. Knee joint.
I have worn an artificial leg of your make since last June; thigh amputation. I have been doing the greater part of the housework on a farm for my family of five. May 23, 1904.

MANUEL A. PARRAGA—San Salvador, Central America.
It is nineteen years since I obtained an artificial leg from you. During this period I have not had an opportunity to find the least fault with it. I walk very much, and without a cane or support. I suffer no pain or uneasiness.
Since I have returned to Central America I find it necessary to make long journeys on horseback. In this the leg has assisted me very much. I pride myself on my easy and graceful movements, and the facility with which I mount and dismount.
The India-rubber foot is a most excellent invention; without it I question my ability to walk with safety in this country, the streets are so very rough and stony.

* G. E. PARSONS—Time Keeper, Shannon Co., Mo. Wrist.
The artificial hand purchased from you eight months ago is in perfect repair, and has given all the satisfaction promised by you.
I find it especially helpful in my office work, in telegraphing, handling books, papers, etc. May 23, 1904.

D. J. PATTERSON—Worcester Co., Mass. Below elbow.
The artificial arm that I received from you some time ago is all that I expected. I have worn it every day, and find it a great help. July 11, 1904.

* FRITZ HEDWIG PAUL—Dentist, Germany. Ankle.
I am very well satisfied with the artificial foot you made in 1897, and fully as well satisfied with the one you recently made for me in June, 1901. I bought the second one so as to have a duplicate.
Your happy combination of aluminum with sponge rubber is, for such cases as mine (amputation through the ankle joint), an ideal one.—Translated from German.

* W. E. PAWSON—Wellington, New Zealand.

As the result of an accident I lost my right leg in the knee joint. I have had four years' experience of wearing one of your artificial limbs, and have no hesitation in saying that they are unsurpassed. I may state that I could not have been better fitted had I been measured and fitted in New York personally. I have not once had occasion to leave the limb off on account of soreness of any kind whatever, and consequently do not feel the loss of my own limb to the extent I at first thought.

The rubber foot is the invention of the age, being every bit as flexible as the human foot. In ascending hills it affords every facility. In fact, my friends express surprise at the easy manner with which I negotiate this task; but the rubber foot does it all. I am quite satisfied. I have recommended several to you for limbs, and have no hesitation in doing so, as I feel sure I am doing the right thing in their best interests.

HENRY PEARCE, M. D.—Office of Dr. Henry Pearce & Co., Druggists, Dutchess Co., N. Y. Above knee.

I have worn artificial legs for about twenty-eight years, and one of Marks' patent for about twenty-three years.

I regard yours far preferable to any other I have ever seen.

My amputation is above the knee.

Your leg is so simple and durable that there is no chance for anything to give out.

REV. R. B. PEET—Rector, Santa Clara Co., Cal. Above knee.

Larger experience has only served to make me more satisfied with the work that you have done for me. The special points that have given me satisfaction are three—viz.: the leg fits well, it makes no noise, and needs no repairs.

* ADOLFO PEREZ—Zacualtipan, Mexico. Above knee.

I beg to say the leg made me is much more satisfactory than the one I used before. I can walk perfectly with it, although the ground is very uneven here. I feel very grateful to you, as all should be who have been relieved by you as I have been, after so much suffering.—Translated from Spanish.

* JOAQUIN PEREZ—Railroad Employee, Uruguay. Above knee.

Recognizing the value of the artificial limbs invented by you, especially the leg you sent me, I am pleased to state that I wear it every day without any difficulty, although the stump is only three inches in length below the body. I feel grateful to you for having enabled me to walk naturally again.—Translated from Spanish.

* CHARLES PERINE—Talledega Co., Ala. Below knee.

I am glad to say that my artificial limb is giving satisfaction. I put it on the 26th of March, 1903, and it has not given me any trouble. I sometimes fire the locomotive. It seems as if I had both my own limbs instead of one artificial one. I can catch a locomotive almost as good as I could before my foot was cut off. I believe yours are the best limbs that are made. May 1, 1904.

* HERBERT E. PERKINS—Truckman, Oxford Co., Me. Below knee.

I am a truckman. Have worn artificial limbs for twelve years. I consider your artificial limbs superior to others. I find I can walk as fast as anyone who has two good feet. May 18, 1904.

L. G. PERRINE—Conductor, Monmouth Co., N. J. Instep.

My foot is partly amputated, the heel is all that remains, for fifteen years I stumped about on my heel, making painful attempts at walking. I did not believe anything could be done for a partial foot amputation. Since getting your aluminum socket leg I am

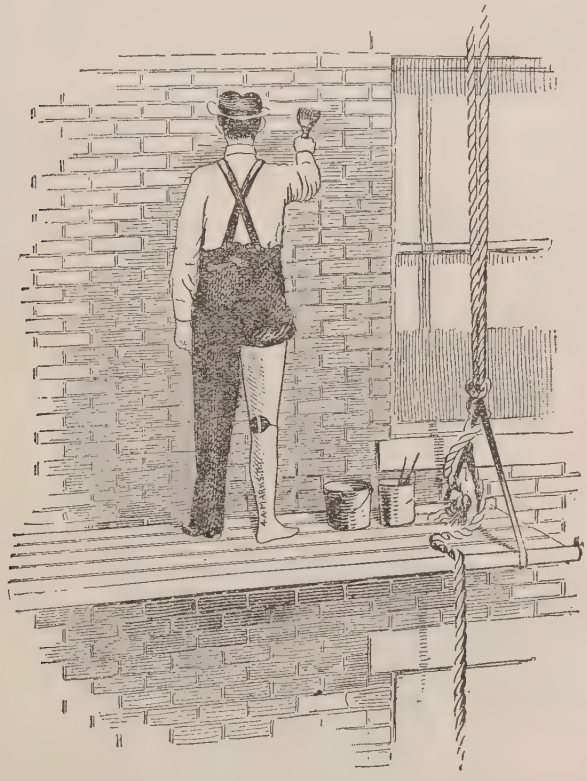
able to walk without limping, and without the least pain or discomfort. I wouldn't part with it for ten times its cost if I couldn't get another one like it. My friends say I don't limp a bit, and I will challenge any man with two good feet, in the State of New Jersey to straight walking without limping. I am a conductor on the C. R. R. of N. J. May 17, 1904.

* A. R. PERRY—Farmer, Franklin Co., Vt. Below elbow.

I applied your artificial arm three months after amputation, and have worn it almost continually ever since, and now can do most of the farm work as well as I used to. I shouldn't know how to get along without the arm. June 1, 1904.

ROBERT H. PERRY—Hudson Co., N. J. Above knee.

I am still wearing the leg you furnished fourteen years ago. I have worn it comfortably with less than six dollars cost for re-



pairs. My occupation (house painter) gives it a good test. I can and do work on scaffolds, ladders—in fact, anywhere. I have but a three-inch stump. I am well satisfied.

* EDWARD PETERSON—Cabinet Maker, Chautauqua Co., N. Y.

I would not be without my artificial arm as it seems nearly as good as the natural one. May 23, 1904.

* EDWARD PATERSON—Cabinet Maker, Chautauqua Co., N. Y.

The arm which I received from you a few months ago gives satisfaction. I am able to get along quite well in my work, which is that of a finisher in a furniture shop. May 31, 1904.

* ALICE PFOHL—South Africa. Below knee.

You may think me ungrateful for not acknowledging the receipt of the leg, and letting you know how I am getting on with it. I received the leg a few days before Christmas, and have been wearing it ever since, and am glad to say it gives me every satisfaction, both in comfort and efficiency.

E. F. PHILLIPS, M. D.—Schuylkill Co., Pa.

Allow me to congratulate you on the perfect fit you have made for Mr. Jacob Ball, whose measurements and diagrams I took and sent you for an artificial leg. The people here who do not know that he lost a limb have not detected it in his walking. Mr. Ball is certainly a walking advertisement for you.

* LAURENT POISSANT—Schoolboy, Quebec. Above knee.

I walk like a man. At first I had some difficulty, but now I am accustomed to it, I do not use a cane. I am going to school.—Translated from French. May 5, 1904.

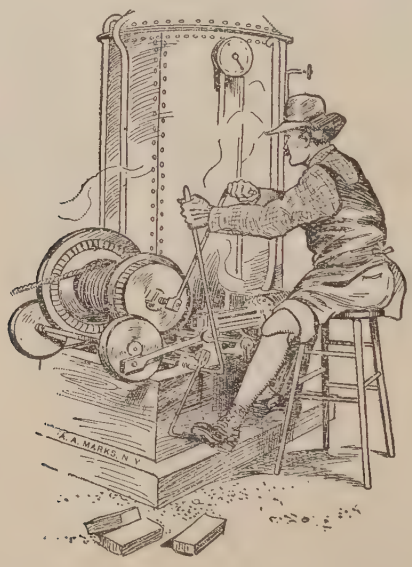
* EARL PORTER—Farmer, Ellis Co., Kas. Below knee.

The artificial leg I obtained from you a year ago last April is giving excellent satisfaction. I have a stump reaching to a short distance above the ankle, and I walk very naturally and helpfully. I am on my feet from seven o'clock in the morning until eight o'clock in the evening. Many of my friends tell me that they would not suspect that I was wearing an artificial leg. I can skate and ride a bicycle. May 23, 1904.

HOMER F. PORTER—New Haven Co., Conn. Above knee.

I have been employed by the N. Y., H. R. R. as a hoisting engineer for the past year.

I have to work two brakes, one with my artificial limb and one with my natural, and also two levers with my hands. I have to



climb a sixty-foot pole every morning. I do my own firing and all the work about the engine room. May 15, 1904.

* P. POWERS—Laborer, Cook Co., Ill. Below knee.

I have been doing hard work for eleven years since I got your leg. I was then 23 years old, now I am 34, and I must say there isn't a man of my age that can beat me. I do any kind of hard work. I carry heavy sacks a long distance on my back, nobody can tell I wear an artificial leg. My friends, who know I have one, often ask which is the artificial. May 28, 1904.

* CECIL PRATT—Farmer, Belmont Co., Ohio. Below elbow.

The arm you made for me fits perfectly, and is very useful. I have had my arm about ten months. May 5, 1904.

* MISS MARION BLANCHE PRINCE—Teacher, Newfoundland.

Nearly five years ago I had to have my left arm amputated owing to disease. It affords me great pleasure to state that having of late obtained one of your artificial hands, I am more than pleased with the results.

The rubber hand is indeed something to be proud of, and enables me, as a school teacher, to handle all the work with ease. I would not be without it for anything. April 29, 1904.

* JAMES W. PRITCHETT—Saw Filer, Gibson Co., Ind.

I have to say that the artificial leg you made me from measurements fits as perfectly as possible.

If I had come to the shop and you had taken the measurements yourself, I doubt that results would have been better.

I have worn it for about eight years. I put it on the next day after I got it, and have worn it every day since, from early in the morning until late at night. My occupation is circular and band

saw filer; I keep up all the saws for a large circular and band sawmill. I have to be on my feet most all day. I get around almost anywhere without a stick. As to the rubber foot, I think it is the finest thing out. It does not jar me when I make a misstep. I only have six inches of a stump, and I get around better than others I see that have worn other makes of legs.

WILLIAM PORTER—Hotel Clerk, Hudson Co., N. J. Below knee.
On Dec. 6, 1887, I had the misfortune of losing one of my limbs about six inches below the knee, and since that time I have worn two different makes. The first lasted me less than three years, then I tried yours, and it has proved just the thing. I am able to ride a bicycle, dance, or do most anything a person with two natural limbs can do. May 20, 1904.

* ERIC A. A. POTTER—Hairdresser, New Zealand. Above knee.
I received the artificial leg you made for me about eight months ago, and have had no trouble in walking about with ease and comfort.
I have seen several makes of artificial legs, and I consider the "Marks'" with the patent rubber foot the best. I take much pleasure in recommending the "Marks." June 9, 1904.

J. DENSMORE POTTER, M. D.—Onondaga Co., N. Y.
Mrs. K. E. Cardner's leg works to a charm. She can get about without even a walking-cane, on the Marks' leg. She does her housework without any difficulty.

PHILORUM POULIN—Brakeman, Quebec. Below knee.
I am pleased to give you information about my artificial leg. I am well satisfied. I dance, and walk five or six miles without being fatigued, and I do all sorts of work. My position is assistant at a telegraph station.—Translated from French. Oct. 9, 1904.

C. W. POWELL—Bookkeeper, Missoula Co., Mont. Above knee.
I would say that I have worn an artificial leg made by your firm for about three years. My leg was amputated above the knee, and since wearing your limb I have experienced no difficulty in getting about and attending to business. Wearing the leg is attended with no discomfort, and I would be pleased to recommend your house to persons so afflicted as to need your services. April 29, 1904.

* J. D. POWELL—Farmer, Lauderdale Co., Miss. Below knee.
I take pleasure in speaking a word of praise for your artificial limbs. I am now using the second one. The first I bought from you lasted seventeen years. I did all kinds of farm work, such as plowing and hoeing, in fact any kind of work a farmer has to do. I am a farmer and know how to appreciate the use of a good leg. I am highly pleased with the second one, it has some improvements over the first that I much like. May 10, 1904.

* CARL PROHL—New Zealand. Ankle.
I had my foot taken off at the ankle joint when I was seven years of age, when I reached the age of nineteen I had an artificial foot made by you. Ever since then I have had every satisfaction with it. I can ride on a bike, and have done some very heavy work with it. I let everyone know about the merits of your artificial limbs, and hope that I have induced others to patronize you.
June 29, 1904.

JOSEPH PUGMIRE—Button Machinist, Westchester Co., N. Y.
I have been wearing the new leg for a year and a half without any fault to find. It is all right. I am working at Hodgman's rubber factory, working button machines of all kinds for ten hours a day, and it never troubles me any. There are plenty working there that don't know that I have a wooden leg. Can walk as good as any of them. My leg is off below the knee six inches. I have had four of your legs since 1867, and when I have to have another it will still be one of yours. May 18, 1904.

* All testimonials marked * were written by persons whose artificial limbs were made and fitted from measurements.

* GEORGE H. PURCHASE—Douglas Co., Wis. Below elbow.

I think my arm in every particular is a grand success, and I will always be pleased to speak in its praise to my fellow-unfortunates. No doubt you will be greatly surprised to know that I

wrote this entire letter and addressed envelope with my artificial hand. I think if you will compare this with former letters of mine you will pronounce this the best writing.

* GEORGE W. PURDY—Sailor, Bristol Co., Mass. Shoulder.

The arm I ordered of you two years ago gives perfect satisfaction. The rubber hand is immense. I do not think that there is anything to be had to equal it. It looks perfectly natural, in fact, some of my friends did not know that I had lost an arm. Being a sailor, it enables me to do many things which I could not do without it. I can go aloft, take my turn at the wheel, cut meat, and hold my fork. I have seen several kinds of artificial arms, but none to equal yours with the rubber hand. The hook attachment is very valuable. June 19, 1904.

* E. M. PYER—Bookkeeper, Grafton Co., N. H. Instep.

I bought an artificial foot from you two years ago, and it gives me great satisfaction. I run a machine in a shoe shop, and I go hunting and fishing, and frequently attend dances. Dec. 6, 1904.

SAMUEL RAPP, M. D.—New York City. Below elbow.

I well know that Edward Wiley, who is now absent, is satisfied with his hand; he is able to drive a team of horses, and do other farm work.

* A. M. REDDING—Salt Lake Co., Utah. Below knee.

The leg I purchased from you in December, 1898, has proved entirely satisfactory, it is in good condition, and I've never had one cent expense with it. I was only sixteen years old when I began wearing your leg, and having grown considerably since the leg has been lengthened to meet this growth. June 1, 1904.

* MISS EMMA REEVE—Newfoundland. Above knee.

I am more than pleased with my artificial leg with rubber foot. I have been wearing it for a little over a year; it has proved satisfactory in every respect. I have worn the old style of leg, but your limb has proven far superior. I am able to do my work both indoors and out. It is a perfect fit, and I would not be without it for anything. May 5, 1904.

* MRS. CLEMENT QUINN—Wright Co., Quebec. Above knee.

Having worn one of your artificial legs, with a rubber foot, for the past thirteen months, I take pleasure in letting you know how well I am getting along. My stump is a little over six inches from

the body. (Amputation caused by tuberculosis in the knee joint.) I can walk without the aid of a cane, and do all my housework.

April 20, 1904.

* AUGUST REICHENBACH—Farmer, Arkansas Co., Ark.

I am well satisfied with the leg. Having worn an ankle-joint leg, I had enough trouble and lost time to keep it in repair, more than enough to pay for one of your legs. I can walk faster, though I have only a nine inch stump. My occupation is farming. I can get around anywhere with the leg, do not use cane or crutch. I put up a lot of hay every year, and do more work, and get around as well as lots of men that have two good legs. Can recommend your make to anyone in need. May 14, 1904.

JOSEPH P. REICHERT—Towerman, Union Co., N. J. Above elbow.

I have been wearing one of your artificial arms for the past year and a half, and will say that it has given me full satisfaction, would not be without it under any consideration, have done with it everything that you claim for it. May 7, 1904.

* THOMAS WARD REID—Age 18, Nova Scotia.

I have used a pair of your artificial legs for six years, and can walk one mile in eleven minutes. Your patents are the best I know, and I always speak well of your work. Dec. 7, 1904.

F. E. REINWALD—Farmer, Tioga Co., Pa. Shortened leg.

Having worn an appliance for a deformed limb since last fall, I can positively assure all my unfortunate friends that they do not comprehend the advantages of an artificial limb until they have used one of yours.

Since I have worn the appliance I can get around much better and do more work, and meet the demands of my vocation much better than before. May 9, 1904.

* J. C. REVELL—Farmer (age 77), Obion Co., Tenn. Below knee.
Having worn a leg, made by another firm, with much suffering and little help, I was hard to persuade to buy yours. My doctor, however, got me to make another attempt, on a sponge rubber foot. I am seventy-seven years of age, and have worn the leg with ease and comfort for more than two years. I look after my farming interests, and can walk a mile any day. The limb you made for me is giving satisfaction, and I cheerfully commend you to anyone who needs a first-class artificial limb. May 31, 1904.

* H. D. RINEHART—Fireman, Lewis Co., W. Va. Below elbow.
I received my artificial arm in good condition, and am much pleased with the rubber hand. My arm is amputated 3½ inches

below the elbow. I am a fireman stationed in the mill. I can perform my work all right. I would not do without my arm.
Jan 29, 1903.

* JOSE MONGE REYES—Lawyer, Costa Rica. Above elbow.
I have the pleasure of stating that immediately after having sent you the measurements for my left arm, amputated two inches below the shoulder, I received from you in the month of January, an artificial one, which fits me perfectly well, and serves me up till now without any repairs at all. By reason of my occupation necessitating my frequent appearance in public places, I can fully appreciate what a boon your work is doing to humanity.

* DANIEL RHODES—Driver, San Miguel Co., N. M. Below knee.
In regard to the limb you made for me, I cannot find enough words to give proper praise. I had worn two before I got yours. One made in New York, and the other in Kansas City, but they would not last. I got one of your limbs, have worn it eleven years hard usage as a hack driver. Although I have a dislocation of my stump, I can dance, ride horseback, do most anything I could before I lost my leg. Have got the second limb, as a reserve in case of an accident. They just can't be beat. It is the best artificial limb that ever came over the pike. May 9, 1904.

* A. W. RHORER—Bell Co., Kentucky. Above knee.

I have been wearing your leg for six years, and have found it highly satisfactory in every particular. Although my amputation is above the knee, nevertheless I walk without the least inconvenience and except to the close observer, no defect is noticed in my walking. I am at present in college, and indulge in most of the sports that the other boys do.

I most heartily recommend A. A. Marks' limbs as being the easiest walking, most durable I have ever seen. May 2, 1904.

A. E. RICHARDSON—Mechanic, Tolland Co., Conn. Instep.

I take great comfort in wearing the foot you made me. I could not be without it a day. I can walk any distance without the least discomfort. May 4, 1904.

* CYRUS RIDENOUR—Shoemaker, Washington Co., Md.

I am wearing your artificial leg every day, and I get along very well. I don't think there is any other leg made as good as the rubber foot leg. I am a shoemaker by trade, but can do all kinds of laboring. I can plow, dig, and saw and cut wood, and in fact everything that is to be done on a country farm. May 16, 1904.

* N. C. RIDGE—Farmer, Randolph Co., N. C. Below knee.

It has been two years last April since I ordered my artificial leg from you. I have been wearing it since that time. My neighbors are surprised to see me get about so well. My occupation is farming. I use a reaper, and cart all of my wheat myself, haul logs and lumber same as ever. May 23, 1904.

* JOHN RIDOUT—Miner. Newfoundland. Below knee.

Just a line to let you know how my leg is. I can walk very well, in fact, I can walk so that one can barely detect I have an artificial leg. I can walk in snow shoes. There is no chafing, or any unpleasant trouble with the stump. June 9, 1904.

* CHARLES RILEY—Telegraph Operator, Hall Co., Neb. Knee.

The artificial leg gives good satisfaction. I would have no other. I am a telegraph operator, and have to climb poles 25 feet high, night and morning, to put up and take down signal lamp. This I do easily and with safety. April 30, 1904.

* THOMAS F. RILEY—Bennington Co., Vt. Shortened leg.

I must say that the extension shoe made by your firm has given me great satisfaction, it is far superior to anything that I have worn, or have ever seen worn by others. It enables me to get about with ease, and in a natural manner. May 9, 1904.

* C. H. RIST—Farmer, Erath Co., Tex. Above knee.

About four years ago, I got one of your artificial limbs, and have been wearing it all that time. It fits just splendid, and is so easy to wear I can't praise your limbs too highly. I recommend them to all who are in need of them. They are the best artificial limbs in the market. That I might have a reserve leg in case of an accident, I got a new one about a year ago, and have worn it enough to know that it cannot be beat. It fits perfectly in every way, and is very easy to wear. May 7, 1904.

* LUMAN ROBINSON—Ranchman, William Co., N. D. Below elbow.

The artificial arm and hand that I bought of you two years ago is all right, it is a nice fit, and helps me to do many things that I could not do before. I am sixty years old, I handle horses, I hitch up and drive wild and unbroken ranch horses. April 29, 1904.

* W. A. ROCK—Engineer, Oil Co., Miss. Below elbow.

Six years ago I lost a part of my right hand, one month later I purchased of you an artificial hand, which I have worn constantly for four years. The work performed by this hand is of the most

severe kind, being an engineer in charge of an oil mill, doing all kinds of repairing, etc. The hand is valuable far beyond any estimate I could put on it. May 23, 1904.

* LUDWIG ROGER—Carpenter, Danish West Indies. Below knee.

I take great pleasure to inform you that I am very well satisfied with the "Artificial Leg" you made for me in June, 1903, as also the prompt manner in which the order was executed. I use constantly at my occupation, which frequently takes me on board ships, and I always feel perfectly safe. May 26, 1904.

* GEORGE RISDON—Beadle Co., S. Dak. Both insteps.

I am very much pleased with my feet; I walk first rate with them. Last week I walked from Huron out to my farm, a distance

of thirteen miles, and my feet never felt easier than when I got to the end of my journey. (Partial amputation of both feet.)

VENCESLAO ROMERO—Farmer, Valencia Co., N. M. Below elbow.

I will state that since I bought the artificial hand from you last year, I have been well pleased, for it did not trouble me even on the first day I wore it, and now it is so useful to me in farm work, in which I am employed.—Translated from Spanish. April 27, 1904.

JOHN S. ROSEWARNE—Mill Engineer, Morris Co., N. J.

Two years last April I met with an accident in which I had to have my left leg amputated about seven inches below the knee. The 21st of May I got an artificial leg from you, and have been wearing it every day since with the greatest satisfaction.

I am an engineer by occupation. Am glad to say I can run, jump, play ball, ride a bicycle, and climb.

We have a smokestack 112 feet high in our town, which I can climb without the least trouble. May 5, 1904.

JOHN ROSSBACK—Coachman, Essex Co., N. J. Ankle.

I wish to state that I am wearing your artificial limb for ankle-joint amputation for the past five years, and I can recommend it to be a perfect success.

My present occupation is coachman, my previous occupation was

driving coal wagons, and I can guarantee to run one hundred yards in sixteen seconds. May 16, 1904.

LEON ROTTE—Captain, France. Above knee.

I am pleased to have the opportunity to state publicly that you have constructed an artificial leg for me, with which I walk with comfort and perfect facility, without any fatigue, and almost as well as with my natural leg, which was amputated fifteen centimeters (six inches) above the knee. I do not limp. I am perfectly comfortable, and able to undertake long sea voyages, and journeys by railroad. I go down into the engine rooms of the steamers, and into the store rooms and holds without difficulty. Before I wore a Marks' leg I could not do these things.

There is no better apparatus than your leg, that is so clean, strong, simple, healthy, and absolutely comfortable. The rubber foot gives me the sensation of walking on my natural foot.—Translated from French. June 20, 1904.

* MISS EUPHEMIE ROY—Housework, New Brunswick.

I am a farmer's daughter, in my sixteenth year. It is not very long since I got your artificial limb. I am really more than satisfied with it. My occupation is farmwork, and a stranger would never notice that I wore an artificial limb. I am very comfortable with it. May 14, 1904.

J. H. ROY—Bookkeeper, Sherbrooke Co., Quebec. Above knee.

In the year 1902 I had the misfortune to lose my right leg. The amputation was caused by a fracture, which afterwards caused the decay of the femur. My stump is very short; was a long time healing. In the month of September my doctors declared my case hopeless, unless I underwent another operation, but this I would not do. I left my town for New York on October 21, 1902, just seven months after the last amputation, feeling blue, as my friends all told me of the uselessness of an artificial leg for so short a stump, only three inches from the body.

I went to the works of A. A. Marks, and there found my leg ready to try on, my measurements having been taken by my father and sent ahead of me by five days. I was in the city of New York eight days when my leg was ready to wear. On receiving it I started to walk, and have walked ever since. I used the crutch nine days, and the cane only a month. April 19, 1904.

* WILLIAM ROYLE—Typewriter, Newfoundland. Shortened leg.

For four years I have been wearing an appliance for a shortened leg. Through hip disease my right leg became six and a half inches shorter than the left. Mr. H. C. Morris took the required measurements and diagrams, and you furnished me with an extension that has given entire satisfaction. For fourteen years previous to being supplied with your extensions, I used two crutches, which injured my health. But thanks to your invention I am to-day in perfect health, can walk almost any distance without feeling the least fatigue. April 27, 1904.

* BERTIE RUBLE—Stenographer, Tazewell Co., Va. Below knee.

I received my artificial limb on the 19th of March, in good condition, and have worn it every day since with perfect satisfaction and comfort. I have never had occasion to use a cane, except the first day that I attempted to walk. I am more than pleased the way I get about, my own foot, before it was amputated, was a burden to me, and now to think I can walk like other people. I am a stenographer and bookkeeper, and can get around nicely at my work. May 10, 1904.

* All testimonials marked * were written by persons whose artificial limbs were made and fitted from measurements.

J. C. RUSSELL, M. D.—Franklin Co., N. Y.

The artificial leg that A. A. Marks made for a patient of mine, a boy ten years of age, is perfect in every particular, and the ease and grace with which he runs about and uses it is remarkable.

Amputation was performed October 25. November 29 the boy was sliding on the ice with his playmates. January 10 the boy was skating, with practically no inconvenience whatsoever. I think the Marks' limb one of the greatest boons to unfortunate humanity that exists.

P. A. RUSSELL—Brooklyn, N. Y. Below knee.

I am pleased with the excellent qualities of material and workmanship displayed in the mechanical construction of my artificial leg, also the careful and painstaking treatment I received during its making and adjustment.

My amputation so involves the knee-joint as to render my case an extremely difficult one. I am able to get about upon my new Marks' leg with a degree of comfort and satisfaction unknown before. May 26, 1904.

C. A. RYDER, M. D.—Clarke Co., Ga.

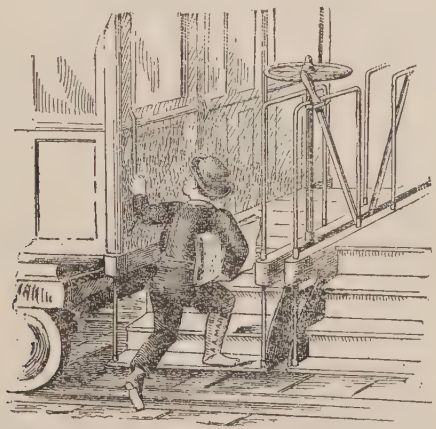
If you want an indorsement of your leg I can give you a good one, for I am wearing my second leg from you, and I could have nothing better, save my natural leg.

* E. N. RYER—Sewing Machine Operator, Grafton Co., N. H.

I bought an artificial leg from your firm two years ago, and it gives me great satisfaction. I run a machine in a shoe shop, and I go hunting and fishing, and for the past six months I have averaged going to two dances a week. Dec. 6, 1904.

JOHN SCHARFF—Newsboy, Westchester Co., N. Y. Ankle.

I sell morning papers on the R. R. trains, get on and off while the train is in motion, and wear one of your rubber feet; very few of



my friends know of the fact, and those who do regard me as the possessor of a remarkable foot. I experience no inconvenience; I heartily recommend your leg as the best made.

VALENTINE SCHICK—Farmer, Sullivan Co., N. Y. Knee.

I am wearing one of your knee-bearing legs with comfort and satisfaction. I can do all farm work. Last December I lost my house by fire, and this spring I have built a new one. I climbed all over the scaffold and a forty foot ladder. Am going to paint the house myself, which is quite a job. I will recommend your limbs to anyone that is in need of them. May 19, 1905.

* WM. SACHREY—Miner, Newfoundland. Above knee.

I received from your firm an artificial leg in October, 1902, and am greatly pleased with it. I used to go to my work with a crutch, and found it both difficult and wearisome. Hearing of the benefit accruing to one in my condition by the use of an artificial leg, I wrote your firm, and the leg duly arrived. Mr. Morris acted for me, took my measurements and negotiated the sale. I can walk a distance with comparative ease, and without suffering; the leg is indeed a boon to me. May 19, 1904.

* W. A. SADLER—England. Below knee.

Although I only sent my measure to you, my leg fits very well indeed. Last Sunday I got on splendid. After being used to the ankle-joint patent, I can say that with the India-rubber foot, the ankle joint is not necessary at all. I find it is nicer to walk with, and much better for uneven places, and for going up hill, and as I live on a hill, I appreciate the difference. I find that it is much better at night, as I am not afraid to step with it, and don't require to feel my way so much. I am complimented on my walking, and it is much lighter than my other make.

SAMUEL P. SADTLER—Philadelphia, Pa. Instep.

My right foot was crushed in an accident on the railroad in 1863, when I was sixteen years old, and although it healed well, I have always walked with a limp. The legs I used prior to visiting you were heavy, and the limp in walking was quite noticeable. You fitted me comfortably with a light and strong leg, which I can slip in and out of as an ordinary shoe. I have no hesitation in commending your work to anyone who may be in need of similar help. May 17, 1904.

* E. B. SAINSBURY—Student, Newfoundland. Above knee.

A year ago your firm supplied me with an artificial leg. I have worn it continually since I have had it, and have found it very useful and comfortable.

Although not engaged in an occupation which requires constant use of the limb, yet I can walk a distance of two miles at a time without feeling any wearing effects, though the amputation is some five inches above the knee. April 10, 1904.

* BERT SALES—Range Rider, Cook Co., Wyo. Above knee.

In regard to my leg, I am well satisfied, for I am a range rider and it seems to stand the test. I am out all day, and part of every night, on guard of a herd of cattle, and I get around in the dark with very little difficulty. I put the leg on the day I got it, and wore it steady until now, very near two years, and it has never hurt or chafed the stump. June 10, 1904.

* F. E. SANGER, M. D.—Grafton Co., N. H.

The leg bought of A. A. Marks is perfectly satisfactory.

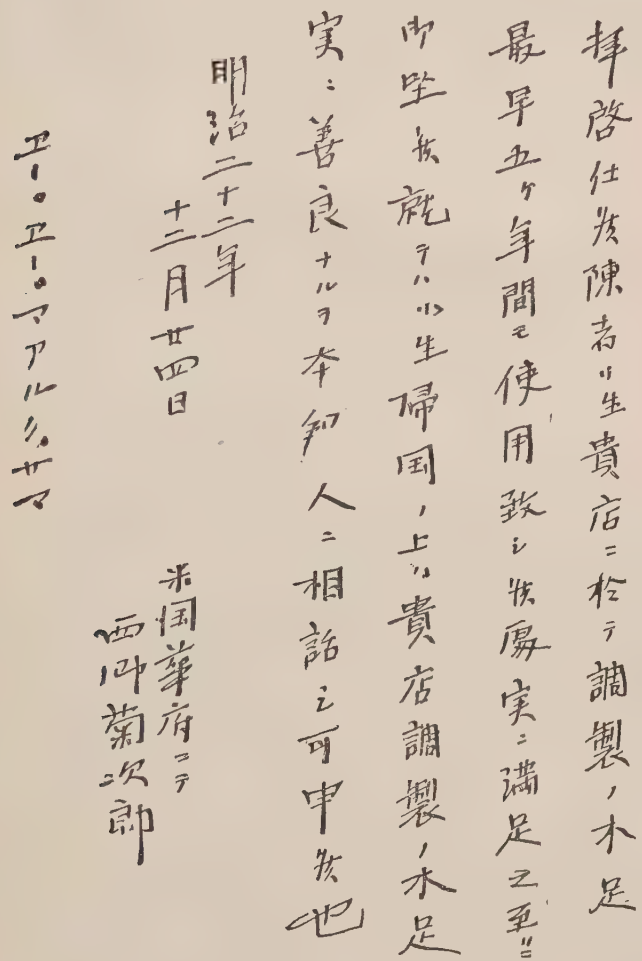
* LOUIS F. SAPIER—Nova Scotia. Below knee.

I am getting along very well with the artificial leg I bought from you in November, 1899. I am working, and make two or three shifts at a time without taking my leg off. When I am in need of an artificial leg I will buy it of you, as I do not believe there is a better one. I want the next to be as near like the one I now wear as possible, as it supplies my every want. June 3, 1904.

* F. C. SAYL—New Zealand. Below elbow.

It is with pleasure I inform you I received the artificial arm you made for me last February. I have been wearing it ever since. I am now quite used to it, and find that I could not do without it. Previously I was engaged at farm and laboring work. I get along wonderfully well with the assistance of the artificial arm. I use a knife at the table very well. June 15, 1904.

K. SAIGO—Japanese Legation, Washington, D. C.



Translated from Japanese.

I have worn an artificial leg with rubber foot made by you for the past five years, and assure you it has given me the best of satisfaction. I heartily recommend your work. I shall gladly speak well of it to all my countrymen afflicted as I am when I return to Japan.—Translated from Japanese.

LEWIS A. SAYRE, M. D.—New York.

I have had frequent occasion to apply A. A. Marks' most valuable Patent Artificial Leg, in cases where I have unfortunately been compelled to mutilate my patients by amputation, and the admirable imitation which that substitute has given of the original limb, and the perfect satisfaction to the wearer, is the highest possible commendation that I can give it.

* A. B. SCOTT—Railroading, New Brunswick. Below elbow.

I purchased an artificial arm from you about two years ago, and up to the present time it has proved a perfect success. It is a help to me in many ways. If I had not had it, I could not have done near as much work on the farm as I have, and feel greatly obliged to you for the prompt attention that you have given to me, and

will always work in your interest. I take pleasure in recommending your work to others, and hope that if you publish this letter it will have some effect in influencing persons in need of artificial limbs to patronize you. April 22, 1904.

* A. J. SCOTT—Farmer, Caddo Co., La. Below elbow.

I am very well pleased with your hand. It is a great deal of help to me. I use a fork to advantage in eating. Feb. 5, 1904.

* THOS. A. SCOTT, M. D.—Cherokee Nation, I. T. Below knee.

In 1892 I ordered an artificial limb from you for amputation of left leg below the knee. Measurements were taken at home, by the family physician, and I secured a perfect fit. I have been wearing this limb ever since, and would not be without it. I can do many things that I thought I couldn't before I purchased a limb from you. I am a general practitioner, which necessitates a great deal of horseback riding, which I can do with ease. June 6, 1904.

JOHN M. SEBASTIAN—Lawyer, Owsley Co., Ky. Knee.

I have been wearing your artificial leg, for amputation at the knee-joint, for more than a year and a half, and have been wearing other makes since 1864. I am more pleased with your make than any other kind. It is a decided improvement on all other makes. There are no tendons and springs in the ankle-joint to break and get out of order, causing the front of the foot to drop down, rendering the leg almost useless until repaired. May 14, 1904.

* FRED. H. SEEL—Student, Hamilton Co., Ill. Below knee.

I had my foot amputated above the ankle Sept. 16, 1902. The next spring I ordered an artificial limb from A. A. Marks, and it has given me satisfaction. I would not take four times the money I paid for my limb and do without it. I can get on a horse from the ground, and do almost anything that I did before I lost my leg. May 11, 1904.

* W. D. SELLECK—Painter, Pueblo Co., Colo. Instep.

In the year 1898 you made me an artificial foot for Chopart amputation, which I have worn constantly ever since. I work at the painter's trade, and do a great deal of climbing, in fact, go anywhere a man with good limbs will go, even to painting roofs. I am also

a musician, and play with a military band, I take some very long marches. I went to work for a firm here three years ago, and had been working among twenty men for three months before they knew I was crippled at all. Sept. 19, 1904.

* EUGENIO SELVAGGIO—Argentine Republic. Above knee.

I sent to you for an artificial leg in 1897, it turned out so well that I walk, ride horseback, and do my work without any inconvenience whatever.—Translated from Spanish.

* E. B. SCULL—Store, Arapahoe Co., Col. Both below knee.

I received my limbs July 31, and put them on at once. Wore them that evening and all the following day, working in the store from

six o'clock in the morning until ten o'clock at night. I must say that I am well pleased with them. The fittings are as good as could be made under any circumstances. My limbs are lighter than I expected, as I wrote you in ordering them that I wanted them extra strong, as my work was heavy. They seem to have the requisite strength.

* GILES SHANDS—Porter, Warren Co., Miss. Below knee.

In the year 1891 I lost my leg on the railroad, and I have been using the artificial leg I got of you since my stump healed, and it has given entire satisfaction. It has enabled me to go about without any other support. May 25, 1904.

P. L. SHANNON—Farmer, Spottsylvania Co., Va. Knee.

Have received one of your artificial limbs and have worn it constantly. It gives entire satisfaction in every particular. I can do any kind of work connected with the farm. I have not used cane or crutch since I began wearing it. May 15, 1904.

* JAMES W. SHAW—Teacher, Ozark Co., Mo. Above knee.

I am thinking that you would like to know my opinion of your ability as a manufacturer of artificial limbs, and my appreciation of the leg purchased of you in 1900. I have worn the leg ever since I received it. I walk well, and without a stick or crutch. I am highly pleased with the leg, and expect to purchase another from you when necessary. The leg seems to be solid, and full of vim yet, which makes me think that it will last for years. Apr. 19, 1904.

* ROBERT SHELDON—Butcher, Lehigh Co., Pa. Below elbow.
My rubber hand is very satisfactory. I work every day, and frequently drive fast horses, and ride my bicycle. May 17, 1904.

* GEORGE T. SHERMAN—Mail Carrier, Pueblo Co., Col.
I am very much pleased with my leg. My amputation is six inches above the knee, and I get around so well that lots of friends don't know that I have lost a leg. I am on my feet a good deal of my time, as I am a mail carrier. I also belong to Co. 2, Second Regt., W. O. W. degree team, and march with them, and no one knows or thinks I am a cripple. I cannot say enough in praise of the Marks' limb, and would recommend it to anyone in need. May 17, 1904.

* JOHN SHIELDS—Wire Weaver, Australia. Below knee.
The artificial limb you supplied for me is giving every satisfaction. With other makes I used to have blisters on my stump, causing much pain, as well as inconvenience, especially in hot weather. It is a great comfort. I wish you every success in the completion of patched up humanity, as we say here.

* J. G. SHIRK—Laborer, Dickinson Co., Kas. Below knee.
The limb fits me all right. I have been wearing it ever since 1870, am getting old, but get along good. Do all kinds of farm work. Would recommend them to anyone in need of limbs. May 20, 1904.

* DAVID C. SHOEMAKER—Mill Hand, Columbia Co., Pa.
The artificial hand you made for me is a perfect fit, and I would not know how to get along without it, it has exceeded my expectations. I can turn and do all kinds of bench work the same as I did before. May 16, 1904.

MILTON SHOREY—Farmer, Aroostook Co., Maine. Below knee.
It is a pleasure for me to inform you that the leg you made for me over a year ago has given complete satisfaction. I am on my feet all day. My business requires heavy lifting, and real hard work, but I have experienced no difficulty whatsoever with the artificial leg, and I wish to express my sincere gratitude for the excellent substitute you made me. Aug. 5, 1904.

* MRS. JOHN SHULTZ—Baltimore Co., Md. Below knee.
I am wearing one of your artificial limbs with rubber foot, made from measurements, and find it entirely satisfactory. May 6, 1904.

* J. H. SIDDONS—Singapore. Above knee.
The first trial on your artificial leg I found to be a bit awkward, as I had been accustomed to those that had ankle joints, but after using it a while, I find that I can walk better and faster with your make. The knee joint is very safe in walking, as it does not bend suddenly when least expected, and the roller suspenders are far more comfortable to wear than the old style. May 4, 1904.

MISS DORA SIEGEL—Bookkeeper, Brooklyn, N. Y. Shoulder.
I have used one of your artificial arms for the past two years, and it has given me great comfort and much satisfaction. It can hardly be discerned from the sound arm, and has helped me a great deal in carrying a satchel and a parasol. May 7, 1904.

* GREGOIRE SIMMELIDY—Manufacturer, Egypt. Below knee.
I wear the leg with great ease. I walk with a rapid gait, just as though I had my natural leg. Everybody is astonished. The perfection of the apparatus replaces my natural limb. Thanks to your rubber foot, I do not feel the loss of my leg, and I very much regret that I was heretofore ignorant of the existence of your esteemed manufactory, which is highly honored by the perfection of its products.

* BENJAMIN SIMMONDS—Accountant, Newfoundland.

I have now worn one of your legs for some time, and I am very glad to say that I am quite satisfied with it. I was fitted from measurements taken by Mr. H. C. Morris. The amputation is four inches above the right knee. I do a lot of walking, and last winter I had to go through snow over three feet deep, and I walked it with no trouble.

It is quite common to listen to people asking which leg is off. I went to a party the other night, and there was a dance. Many who saw me dancing did not know that I wore an artificial leg, and would not believe it when told. April 29, 1904.

GEORGE SHAFER—Farmer, Bergen Co., N. J. Below knee.

My left leg was amputated about six inches below the knee. Your leg suits me very well.

I can do most anything a farmer is required to do, plow, cultivate, and help in a feed store, carrying anything that comes in

bags, and store away a carload of hay in one day, bales weighing from 130 to 160 pounds, and pile them up six feet high. There is a great improvement in the last foot. May 12, 1904.

* LODI SIMON—Bookkeeper, Noble Co., Ind. Ankle.

The artificial leg I received in 1902 has been in constant use since, and it has given full satisfaction in every way. My amputation is just in front of the heel, with part of the ankle bone taken away. I never hesitate to do any kind of work, and often walk three and four miles, and can ride a bicycle fifteen miles an hour.

My present occupation is bookkeeper and clerking, and I am on my feet two-thirds of the time, and it never tires my stump or

chafes it in any way. I am also fond of hunting, and often take long strolls over uneven prairie, and climb hills without fatigue.

If it were impossible for me to purchase another of Mr. Marks' artificial limbs, money could not buy mine. Nobody but my most intimate friends know that I am an artificial limb wearer, as my walk is so natural with your patent rubber foot. May 9, 1904.

T. C. SINGUEFIELD—Clerk, Covington Co., Ala. Knee.

The limb I ordered of you, two years ago, has given complete satisfaction, it has worked so satisfactorily that I have worn it continuously since first putting it on. Used my crutch only one day. I am clerking in a department store, where it is trying to a man with two natural limbs, yet I am standing it all right, and but few people know that I am using an artificial limb. May 11, 1904.

* ANTONIO SIRACUSA—Age 10, Atlantic Co., N. J. Above knee.

I had the misfortune of losing my right limb two inches above the knee. It happened on April 15, 1900, when I was six years old.

About a year after I got one of your artificial limbs. I cannot praise your artificial legs enough. I would not want to be without mine for anything. I do a great deal of walking, and running, play football without any trouble, and just as good as many other boys that have their natural legs. May 21, 1904.

* P. D. SLOAN—Cigars, Hocking Co., Ohio. Knee.

I have worn your artificial limb about six years; can do any kind of work, ride a horse as good as anyone. I run a stogie factory, do all my own selling, and travel through five different counties. I live in a very hilly country, go hunting right along with other hunters in season, and travel over the roughest ground. There is nothing like your rubber foot. I have tried several other makes, and they were all failures. May 16, 1904.

* CLAY SMITH—Porter, Franklin Co., Tenn. Below knee.

I haven't lost a day from work. I walk about two miles every day putting out switch lights, those that do not know that I have lost a foot cannot tell it in my walking. My depot agent is as well

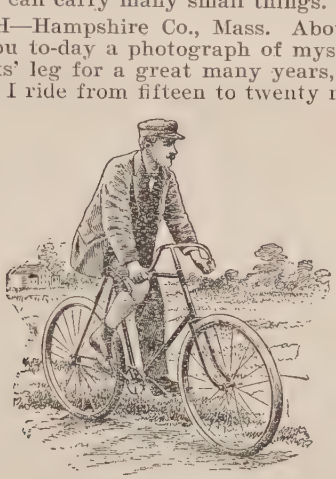
pleased with my limb as I am myself. I have been his porter for five years, and am still able to do the same work. My doctor says it is remarkable the way I carry heavy articles. Sept. 29, 1904.

* MISS ELLA C. SMITH—Coffey Co., Kas. Wrist.

About eight months ago I purchased an artificial hand of A. A. Marks. I have worn it ever since, and think it is fine. I would not be without it now for anything. I am a young housekeeper, and find my hand a great aid in helping me with my work. I can write with my hand and can carry many small things. May 23, 1904.

FRANK H. SMITH—Hampshire Co., Mass. Above knee.

I have mailed you to-day a photograph of myself on a wheel. I have worn a Marks' leg for a great many years, and can do most anything with it. I ride from fifteen to twenty miles almost every



day on the wheel, and have ridden forty. I have walked thirteen miles with hardly a stop. Have used a leg with an ankle-joint, but find the Marks' leg the best.

* H. E. SMITH—Gallatin Co., Ky. Above knee.

When a boy, about fourteen years of age, and residing at Beaverlick, Ky., I was accidentally shot in the right knee. This resulted in the amputation of my leg in the middle of the thigh. It happened in May, 1897. I never used an artificial leg until I got one of you in 1902, which was made from measurements taken and sent to you. It was a perfect fit, and has proved to be a strong and satisfactory one. There is one thing about Mr. Marks' limbs in which they excel all others, that is the rubber foot. June 10, 1904.

* H. W. SMITH—Locomotive Fireman, Cambria Co., Pa. Instep.

I must say that your artificial limbs are good. I have been wearing one for about five years, and I would not have any other. I am a railroad man. May 25, 1904.

J. J. SMITH—Steuben Co., N. Y. Both below knees.

After nearly a year's wear I have to report that the legs you made for me are giving excellent satisfaction. In that time I have not been obliged to lay them aside on account of any sore or inconvenience. Jan. 30, 1905.

* MARK A. SMITH—Machinist, Fairfield Co., Conn. Ankle.

I have worn an artificial foot of your make since 1891. The point of amputation is at the ankle, unjointed, with a portion of the heel remaining. The thirteen years' experience I have had with your artificial limbs has been most satisfactory in every respect. I am a machinist, and stand at the lathe and bench all day with perfect ease and comfort. I suffer none by its use, and the rubber foot, I am afraid I cannot say enough to do it justice. I have never seen or heard of anything to equal it, May 18, 1904.

* RUSSELL E. SMITH—Mill Hand, Bristol Co., Mass. Ankle.
I am wearing one of your artificial limbs for over four years. I work in a grain mill all day with ease and comfort. I can ride a wheel, and play ball as well as if I had my own two feet.
May 6, 1904.

THEO. G. SMITH—Deputy, Chemung Co., N. Y. Below knee.
I desire to say in the fewest words possible that, after wearing three different legs, I am prepared to certify that for ease, comfort, and durability your legs with rubber feet are, and ought to be placed at the head of the list. I have worn your leg over seventeen years.

* GEORGE WILLIAM SMYTH—Manager, So. Africa. Above knee.
I have much pleasure in certifying that your make of artificial limbs is the best.
In March, 1898, I was occupied on the Cape Government Railway as foreman shunter at Alicedale, Cape Colony, when I met with an accident, being run over by a shunting train, which necessitated my right leg being amputated about four inches above the knee joint, and in June of the following year, I was supplied with an artificial limb which was not satisfactory, but in July, 1902, I obtained one of your limbs, which I have had constantly in use ever since and it has given me every satisfaction. Now I am doing work and am able to do all that my daily vocation demands of me. Going up and down hills quite easily.
I strongly recommend the rubber foot, as it is much safer than the old-fashioned ankle-joint.

MRS. G. P. SPALDING—Suffolk Co., Mass. Below knee.
I take great pleasure in stating that the leg is satisfactory in every particular. I experienced very little difficulty in becoming accustomed to wearing it and am able to walk with scarcely any limp.
June 1, 1904.

* FRED SPARKS—Mail Carrier, Union Co., Ohio. Below knee.
The limb I got of you is a wonder. Although I have not had it a year, you or anybody else couldn't perceive that I have an artificial limb. Even my nearest friends didn't know it till I made it known and then you ought to see them. I wouldn't take $25,000 and do without it, that is saying a good deal. It is a great boon to mankind. I am a United States mail carrier and perform my duties with the greatest ease.
May 16, 1904.

* W. R. STAGE—Station Agent, Henry Co., Indiana. Above knee.
I have been wearing one of your legs for about one year and take great pleasure in stating I believe it as near perfection as it is possible to make a leg. I have a seven and a half-inch stump and weigh 240 pounds. I am a station agent and get around well. Have experienced no chafing or unpleasantness.
May 16, 1904.

JOHN STARKEY—Carriage Trimmer, Monmouth Co., N. J.
I am thirty-nine years old, had my leg amputated four and a half inches below the knee when I was ten years old. Started to wear an artificial leg when I was fifteen years old, unfortunately, I got a leg with an ankle joint, it did not last long. I have been wearing a Marks' leg now for fourteen years, and it fills the bill exactly. My occupation is carriage trimmer and anybody will allow that it is hard work.
May 20, 1904.

* J. M. STEPHENSON—School Teacher, Waller Co., Texas.
The leg you made for me gives perfect satisfaction. I can do my work with much ease. It adds to my comfort and appearance. Walking half a mile to my school every morning is no task for me.
May 16, 1904.

LUCIUS J. STEVENS—Sea Captain, Middlesex Co., Conn.

On August 29, 1884, I lost my right foot. I made a careful study of artificial limbs of different makes, and with advice of my doctor selected yours. I applied it on the 1st of December, thirteen weeks after amputation, and in a short time I was able to walk so well that hardly anyone knew I had lost my foot.

I go to sea and take long voyages and my leg never gives me any anxiety. I know and feel that it is strongly made and will last.

* W. G. STEVENSON—Ontario, Canada. Below elbow.

The hand you sent me is perfectly satisfactory in every respect, and I would advise those that are in need of artificial limbs to consult with your firm. I thank you for the nice hand you sent me and the perfect fit. May 17, 1904.

WILLIAM WALLACE STEWART—Druggist, Passaic Co., N. J.

Shortly after graduating, while visiting some relatives, I had the misfortune to be struck on the knee-cap by a rock, which resulted in the loss of my left leg above the knee. I despaired of ever being able to engage in my chosen profession, that of a druggist. I was told by my physician that my case was by no means desperate,

and that I should be able to walk almost as well as ever if I tried one of A. A. Marks' legs. As soon as my stump healed, I went to see Mr. Marks, who provided me with the leg I have worn for two years, and with which I can walk easily and comfortably, attend to my duties as prescription and sales clerk in a busy pharmacy. Mr. Marks deserves unceasing thanks for his skill, care and attention to my case. June 16, 1905.

* S. G. STEWART, M. D.—Shawnee Co., Kan. Ankle.

I have worn an artificial foot since 1879. The point of amputation is at the ankle, with a portion of the heel remaining. It is a modification of Symes' operation.

I had great difficulty in getting an appliance, and I found it a point very difficult to supply with a comfortable and useful foot. I made many unsuccessful trials and about despaired ever being able to walk without the aid of a crutch. A friend advised me to apply to you, as he had some knowledge of the rubber hands and feet. I did so and received directions from you how to take measurements for the appliance. I sent on the measurements and soon received by express the limb and rubber foot. It was a perfect fit and was

comfortable. I could walk with ease and with scarcely a perceptible limp.

I have worn this appliance since September, 1882, and without repairing it.

I am more than pleased with it, and know from experience that you are the only manufacturer of a comfortable and useful limb for the amputations known as Symes' or Chopart's. I am a physician, and see quite a number of people wearing artificial limbs, and am well satisfied that the limbs manufactured with the rubber hands and feet are far superior to any other.

* ARTHUR V. STOUGHTON, M. D.—Uinta Co., Wyo. Below knee.

The artificial leg you made from measurements for J. W. Neilson some time ago is giving excellent satisfaction.

* GEORGE W. STRAUCH—Telegraph Operator, Schuylkill Co., Pa.

The new leg I recently purchased of you is giving the best of satisfaction, indeed, I often wonder if I have it on. A glove on the hand is not more comfortable. I wear it on an average of eighteen hours out of every twenty-four. As a railroad operator it is meeting every requirement in addition to the work of a large garden.

It is twenty-five years since I purchased my first leg of you, and wore the leg continuously and gave it hard usage at the cost of repairs for all that time $8.00. I could have worn it much longer, but it got too small owing to my increasing weight. Last December, 1903, I purchased the second leg. May 9, 1904.

JOHN STROTHER—Farmer, Dutchess Co., N. Y. Below knee.

I take more comfort in wearing your leg than I did in wearing the peg. I can do any kind of work that any other man can on the farm and do it with ease. I can climb a ladder as well as I ever did. People who don't know me can't tell but that I have both good limbs. May 20, 1904.

EDWARD SULLIVAN—Laborer, Philadelphia, Pa. Below knee.

I am wearing your artificial leg for the last eighteen months and get along first-class. Doubt that I shall want any better. I have used others, but got no satisfaction from them. April 28, 1904.

JAMES G. SULLIVAN—Ship Fitter, Brooklyn, N. Y. Ankle.

After I received the foot I went right back to my work carrying heavy iron beams and girders. I am working in the ship-fitting trade, which is considered heavy work. I have found the foot perfectly satisfactory in every way and it answers as well as my own natural one did. July 9, 1904.

J. D. SULLIVAN, M. D.—Brooklyn, N. Y. Knee.

About four years ago my left foot was amputated just above the ankle. The stump was so diseased that about one year later a subsequent amputation at the knee-joint was performed. During the first two years following the first amputation I had three different artificial limbs made by as many different makers. They all were so unsatisfactory that in July, 1902, I had one made by you, which I am pleased to say has surprised my most ardent expectations. Since I have begun to wear your make of artificial limb, I have been able to attend to a large medical and surgical practice, working seven days in every week and doing the same kind of work that I did previously for thirty years. I am fully conscious that it is a great misfortune for any person to lose a limb and I realize how much that affliction is mitigated by you in making limbs to such a high degree of perfection as you have attained in that line.

I have devoted much study to the alleged merits of the various kinds of artificial limbs in the market and come to the conclusion that I shall wear the limb made by you with a rubber foot during the remainder of my life. Kindly accept my compliments on the progress you have made and my grateful appreciation of your kindness to me. April 30, 1904.

* R. L. SUMMERSGILL—Stone Cutter, Greene Co., Pa. Below knee.
Received artificial limb from you about two years ago and it is giving very good satisfaction. My leg is amputated about ten inches below the knee. Wear your limb every day.

I am a stone cutter, handle marble and granite monuments, flag stone, etc., so you see my work is very hard on any person with

two good feet. Will add I don't suppose there is any person gets around much better than I do. April 30, 1904.

* W. B. SUMNER—Farmer, Lawrence Co., Mo. Below knee.
The artificial leg I got from you is a nice fit and is all right. I lost my leg December 24, 1902, and in three months got the leg. I am well pleased with it. I plowed and attended to ten acres of corn the first year, and last fall plowed and sowed twenty acres of wheat, so you see the leg is very helpful. May 23, 1904.

* GEORGE P. SWAN—Laborer, Hartford Co., Conn. Above knee.
I have worn the leg you sent me for nearly two years regularly, it has given entire satisfaction. I can walk much easier and with more convenience than any artificial leg I have ever used. I have the greatest confidence in recommending your make as the best in the world. May 14, 1904.

* J. H. SWARTZEL—Merchant, Augusta Co., Va. Below elbow.
I received the last hand you made for me in 1903. I have been wearing it every day since I got it with perfect satisfaction. I am in the general mercantile business and it is a great help to me. In fact I can't see how I could get along without it. May 23, 1904.

JOSEPH H. SYLVESTER—Boston, Mass. Below knee.
I am happy to state that I still wear the leg you made for me in 1880, and it is in good order. I am using it every day.

I have only paid seven dollars in repairs in all. I have worn legs made by other manufacturers, with wooden feet, and ankle joints, but in all my years of experience I never found myself satisfied until I procured one of your artificial legs with the rubber foot. I walk more naturally and more comfortably than I ever did on the other legs. My work is very laborious, as I have to stand on my feet sixteen hours a day, lifting barrels, and climbing up and down stairs constantly every day. I have walked a mile inside of ten minutes.

* W. R. SWINK—Laborer, Marion Co., Ore. Above knee.

I have been for a long time desirous of writing you and expressing my continued satisfaction with the artificial leg you made for me, and now avail myself of the opportunity. It is five months

since I obtained it. I walk very much and without a cane or support. I suffer no pain or uneasiness from it. My artificial leg is my best friend; without it my life would be miserable.

* DR. R. F. TAGGART—Dentist, Hillsborough Co., Florida.

I have worn A. A. Marks' make of artificial legs since May, 1868. The first one I wore continually for thirty years. The one I am now using I have had one year, stump only five inches long. I have practiced dentistry for the last twenty years. I walk with ease.

May 16, 1904.

F. M. TALBOT—Contractor, Hennepin Co., Minn. Below knee.

In the Fall of 1890 I met with a railroad accident which crushed my leg and amputation was made below the knee, leaving a stump three inches in length. My first experience with an artificial limb was with a Wood Socket, after wearing it for eighteen months I had one made with Slip Socket in preference to having the old one refitted, as my stump had changed considerably and I thought that the trouble was caused from the ill-fit. After wearing the second one for over a year, my stump got in such a condition that my life was in danger and it was impossible for me to attend to my duties. I think it was in 1894 that I called on you and after you had examined my stump, you pronounced it a case of strangulation,

and you said you could make me a limb that would relieve me of that trouble. I ordered the leg of you and have been wearing it for eleven years with perfect comfort and ease. As you will recall I called on you a few weeks since and had you fit a new limb with the improved rubber-foot, which is proving very satisfactory. I am in the contracting business, principally constructing large elevators and foundation work and attend to the outside work, which keeps me on my feet constantly, this I do with as much ease and comfort as any man could that is obliged to wear an artificial limb. Your new rubber foot is a great improvement on the old one. May 17, 1904.

ARTHUR G. TAYLOR—Pedestrian, Warwickshire, England.

When a lad sixteen years old, I had both of my legs cut off in a shuttle train accident, and my life was despaired of, but my robust constitution carried me through. Six months after, the company procured a pair of legs for me made by a local leg-maker, but bad

fitting and construction rendered them of little use. My old fellow workers took up a subscription and bought me a pair of American legs, Marks' patent, with which I can do almost anything. I am now twenty-six years old and engage in all kinds of sports. Recently I walked a match against time and made a mile in twenty minutes. My stumps are hard as nails. All of which I have to thank Marks' patent artificial legs for. June 12, 1905.

F. V. TAPLEY—Aroostook Co., Maine. Wrist joint.

The artificial hand I purchased from you has proved satisfactory in every way. I don't think a stranger would ever know I was wearing an artificial limb, it is so natural, and I would not be without it for twice the amount paid for same. May 2, 1904.

* COLIN M. TAYLOR—Clerk, New Zealand. Below knee.

I have worn your rubber feet for nine years, the one I am now wearing being fitted with the "Spring Mattress," which I find a great improvement. It gives more spring to the walk, enables me to stand on a sloping surface, such as the deck of a ship at sea,

and almost entirely does away with the thumping sound which always accompanies artificial feet.

My occupation at present is that of a bank clerk, but I was three years on a farm and did all the usual rough wo k attached to that industry without suffering any inconvenience. I can run and jump and play tennis. I go in for rowing, and find the foot in no way interferes with the sliding seat. I also ride a bicycle as well as if I were quite sound. In fact I never miss my own foot in anything I attempt to do.

To close with, I can thoroughly recommend your artificial feet for simplicity, durability, and comfort to anyone who has the misfortune to need them.

* ROBERT E. TAYLOR—Clerk, New Zealand. Above elbow.

The arm you made for me in 1902 has given excellent satisfaction. A little over three years ago I had the misfortune to lose my arm owing to blood poisoning. I was recommended to procure an artificial one from your firm. I did so and have never had cause to regret, it is not only ornamental but a protection to the stump, and is very useful. May 26, 1904.

W. H. TAYLOR, M. D.—Jefferson Co., Tenn.

In matter of finish, durability, simplicity of construction, completeness of action, and perfect adaptation to stump, the Marks' artificial limbs are far superior to anything I have ever seen.

* NEWTON TENNEY—Photographer, Randolph Co., West Va.

Having received one of your artificial limbs some time ago, I can say that it has been working first-class. I wouldn't take ten times its cost and do without it. My left foot is amputated four inches above the ankle. My occupation is photographer.

May 10, 1904.

EDWARD C. TERRY—Engineer, Hudson Co., N. J. Part of hand.

The artificial part of hand you made for me in January last has been worn constantly and is of great help and benefit to me. I am in the electrical line, I splice wire, use a file, hack-saw and hold a cold-chisel and find the article indispensable. I dislike to remove it at night when I retire. April 9, 1904.

* FRANK THOMPSON—Light Work, Union Co., S. Dak.

On the 8th of September, 1902, I had an accident and lost my right hand while working at my trade as an engineer, in about two months after, I was wearing one of your artificial limbs. I do not see how it could be made better and would not be without it. May 16, 1904.

* JOHN TRACY—Laborer, Morgan Co., Ohio. Knee-joint.

The artificial leg made for me gives perfect satisfaction. I work very hard with it all the time. I can cheerfully recommend your skill. May 16, 1904.

* WALTER TRACY—Independence Co., Ark. Below knee.

My leg was amputated February 9, 1903, just above the ankle-joint. I have been wearing one of your artificial limbs since December 20th. Am well satisfied with it. I am only a schoolboy, but I can do most anything I try. May 6, 1904.

CHARLES I. TRAVIS—Farming, Westchester Co., N. Y.

My leg was amputated below the knee, cause, gunshot wound in Civil War. My occupation is farming. I have worn one of your legs for six years and have got along all right with it without any repairing. I am an old soldier about sixty years old. My weight is 210 pounds. May 2, 1904.

FRANK TRIACCA—Schoolboy, Fairfield Co., Conn. Below knees.
I am going to school every day and walk both ways. My artificial legs give the best of satisfaction in every way and have proved a

great benefit to me. I walk, run, and play as well as most boys. When I tell persons that both of my legs are artificial, they will not believe me until they examine them. June 10, 1904.

E. TRICKETT—Marion Co., W. Va. Above knee.
The leg you made for me gives the best of satisfaction. I wore it every day for fourteen years without a dollar's expense in repairs and it is in good repair yet. I lost my leg in the Civil War in 1863 and have tried many kinds. Anyone wanting a limb can't do any better than get a Marks' leg. May 10, 1904.

* ALBERT TRITCH—Core Maker in Foundry, Muskingum Co., O.
My limbs are doing well. There are no legs made that can beat yours. I lost both of my legs in a railroad accident about fourteen years ago. I received a pair of legs from you and I have never seen any man with one leg off that can beat me walking. I am a core maker by trade and am working for the Zanesville Malleable Iron Works. May 2, 1904.

SAMUEL TRUESDALE—Late Pension Agent, New York City.
I have been wearing one of your artificial legs with patent rubber foot (amputated below the knee) twenty-eight years. I can say from observation and inquiry with those who are wearing artificial legs, and I know many, that the one I wear (your patent) is in every respect superior, more durable, less liable to get out of order, than any artificial leg I have seen or have any knowledge of.

* W. H. TUCKER—Newfoundland. Below knee.
I have had every satisfaction with the artificial leg you made for me in 1898. I can use it almost as well as the natural foot. There are no sports that I cannot indulge in, I skate, dance, ride a bicycle, kick football, do any mortal thing. My work here is clerk and telegraph operator. March 20, 1905.

THOMAS TURNBULL—Machinist, Quebec. Above knee.

I wish to inform you that the artificial leg you made for me in December, 1902, has given entire satisfaction. My amputation is above the knee, leaving only a five-inch stump. My occupation was fireman, but since my loss I am working in the machine shop. Your leg enables me each day to perform my duties, causing no soreness whatever to the stump. I will always recommend your artificial limbs to my fellow workman. April 25, 1904.

* T. W. TURNER—Farmer, Umatilla Co., Ore. Below knee.

I am now wearing the second limb made by you. The limbs you made for me fit well and have given the best of satisfaction. Have worn it every day without any inconvenience whatever. I do all kinds of work on the farm. I can highly recommend your limbs as first-class in every respect. May 6, 1904.

CHARLES E. UBER—Salesman, Lawrence Co., Pa. Instep.

I desire to say that I would not wear any other limb than yours when I want comfort. Sometime ago I thought that your limbs were high in price, and I tried one from another firm which I have worn only two or three times in three years. May 14, 1904.

* HENRY VAUCK—School Teacher, Fillmore Co., Neb.

On the 22d day of May, 1886, at the age of ten years, I had my left foot amputated above the ankle-joint. After walking on crutches and peg legs until I hurt the stump so badly that the bone protruded, I got an artificial leg from you and began to wear it in November, 1892. In three weeks I walked without aid.

Having been raised on a farm I had to do all kinds of manual labor, and have always been able to do as much as the average able-bodied man, even at shocking grain, which is considered hard labor.

I am a school teacher, and have been in some districts through the term without anyone suspecting I had an artificial leg. Am able to ride a bicycle and have beaten able-bodied men in a foot-race. May 23, 1904.

* ANGEL VIDAL—Mechanic, Argentine Republic. Below elbow.

Five years ago I had the misfortune to have my right hand mangled by a planing machine, so badly, that Dr. Calasco of the City Hospital amputated it two inches above the wrist. When cured and weary of being short of a hand, I decided to write to you and send the measurements. A month later I put the new hand on and it satisfied my wants completely. I am very pleased, as I can eat and do other things with it and therefore I give you my most sincere thanks for the important service which you have rendered me. June 6, 1904.

* REV. ALEXANDRO VILLA—Missionary, Mexico. Wrist.

Three months ago I received my artificial hand, which is such a blessing that I am unable to express in this letter how satisfied I am.

As I am a well-known person throughout the state of Sonora, Mexico, and having lost my left hand, I was very much observed by the people. I endured the loss for twelve years deprived of the privileges of which I am now master. I received a catalogue of your firm, saw the advertisements, but I did not believe that they were exactly as represented until I decided to have a hand made by you. It is useful in eating, in holding many things, especially my Bible, which I hold with my left hand, and turn the leaves with the right, and as I am so well known in the villages, where I preach the Holy Gospel, many ignorant persons who have seen me gesticulate thought that it was supernatural. Formerly I lacked the movement of my arm, now, I move it naturally.—Translated from Spanish. May 15, 1904.

* J. W. VAUGHAN—Bartow Co., Georgia. Partial hand.

My right hand was mangled and amputated September, 1889, and in March following you made me one of your patent rubber hands, since that time I have had the second one made, and between the two wear and use them constantly. I can use mine almost as well as the natural hand. I can drive, use knife at table,

write rapidly, as I am now doing, measure goods by the yard, or most any other work. I was fortunate in having my hand amputated below the wrist, leaving thumb and wrist bones, which enables me to secure the artificial hand around the wrist like a glove. May 15, 1904.

* HARRY GEO. VOIGHT—Stock Raiser, Elko Co., Nev. Above knee.

A little over four years ago I had my right limb amputated above the knee. The following summer I obtained one of your artificial limbs, and a year later got another to have on hand in case of accident. Have worn them since with perfect satisfaction.

Am able to do almost every kind of ranch work, riding horseback, etc. Am pleased to recommend Marks' goods to any who are in need. May 4, 1904.

* MISS E. M. VOSS—New Zealand. Below knee.

The leg ordered for me came to hand about eighteen months ago. I have worn it continuously ever since. I am very well pleased with it. I had my leg amputated when I was eleven years old, I used my crutches for about two years then I got an artificial leg from Wellington. I got on fairly well with it, but I did not get about with as much ease as I do with the one you made. I am engaged in household duties and can get through them without any trouble. I can walk up and down stairs with ease, ride a bicycle and find that the leg does not interfere with anything that I wish to do. The rubber foot gives great assistance when walking.

Aug. 10, 1904.

MICHAEL VAUGHN—Lawyer, Rensselaer Co., N. Y. Below knee.

I got my first leg in 1863 and wore it every day for thirty-three years and it didn't cost me thirty dollars to keep it in repair during that long time. I got my second leg about nine or ten years ago and I am wearing it every day since, and it has not cost two dollars for repairs and is to-day about as good as ever. I am a very heavy man, weighing two hundred and thirty-five pounds. May 9, 1904.

JOHN VEILLEUX—Shoemaker, Quebec. Above knee.

The artificial leg you constructed for me gives complete satisfaction. I am a shoemaker by trade and ever since I have my artificial leg I have not lost an hour's work. Previously I could only work 6 or 7 months in the year. I have walked three miles

and a half and have not suffered any pain in my stump, which is only four inches long on the outside of the thigh and three inches on the inside. I now walk as easily as before my amputation as well as going up and down stairs. I am well satisfied and am very happy to have the opportunity to express my gratitude.—Translated from French. July 12, 1904.

* G. C. WABY—Farmer, New Zealand. Knee.

I beg to say that the leg I received from you made and fitted by measurements, is very satisfactory. I have worn it about eighteen months. I am a retired farmer, in my seventy-first year, and I find the leg invaluable as it enables me to take sufficient exercise to keep in health.

The value of your artificial limbs is enhanced in that they are simple in construction, easily adjusted, durable, and thoroughly well finished. June 2, 1904.

SIDNEY WACHTER—Salesman, New York City, N. Y. Below knee.

My leg was amputated about eight years ago; I was eight years old then. I commenced wearing artificial legs six months after the amputation and will say that your artificial leg comes as near to the natural as it is possible for a substitute. I have been playing baseball nearly every day in summer and could cover almost any position and now I have a position where I am constantly on my feet in the store or walking to different parts of the city selling goods. I can run or do anything which an ordinary person with his natural limbs can do. May 15, 1904.

* J. T. WADE—Engineer, Gibson Co., Tenn. Below knee.

I had the misfortune to lose my right foot about twenty-one years ago, and have worn one of your artificial feet for fifteen years. It has given perfect satisfaction and I am wearing the second one, which is as satisfactory as the first. I am an engineer and I can get about to do my work without any difficulty. May 9, 1904.

THERESA WAGENBLAST—Domestic, New York, N. Y.

I have obtained my second artificial limb from you and am very grateful to you, also to my God for your skillful invention. I am very satisfied and hardly know that I have an artificial leg on. I am just like other housekeepers, on my feet from morning till night. I have spent my life as a servant. I am now fifty-six years of age, and if it were necessary, I could run four miles. I do all the housework without any help. I am willing to give my name and address to any person who desires to interview me upon the subject. May 9, 1904.

J. B. WAGNER—Tailor, New Brunswick. Above knee.

It is with great pleasure that I write you to-day about my artificial leg which I purchased from you in January, 1902. After having used and practiced with ankle articulation and with stiff ankle and rubber foot, I can recommend your artificial leg with rubber foot and stiff ankle as the best, and I will never be without one so long as I have the means and if I ever need to buy another, it will be yours. April 25, 1904.

WM. WALLACE—Awning Hanger, Brooklyn, N. Y. Below knee.

Your leg is an excellent piece of work. I've been hanging awnings for one of the largest firms in the State. I get around just as good and better than the majority of awning men. I can also ride a wheel, something I could not do when I had both of my legs. I can get off my wheel with two hundred pounds on my shoulder, as I often had to do at Long Branch, where the firm has a branch. Aug. 8, 1904.

* THOMAS WARD—Engine Driver, New Zealand. Above knee.

I am very much pleased to be able to say that the leg I received from you is giving every satisfaction. As you are aware, my leg was amputated above the knee, leaving only seven inches of a stump. I drive a log hauling engine in the bush, and can get about without the aid of a stick, and can ride on horseback with ease, in fact, I can get about almost as well as I could before I had my leg amputated. June 2, 1904.

* JAMES A. WATERMAN, M. D.—Caldwell Co., Mo.

Dyke Hornback, for whom I took the measurements and diagrams and sent you the order for a pair of artificial legs, received them three weeks ago to-day. He now walks everywhere, rides horseback, and, in fact, does everything he wishes to. They are a perfect fit, and very satisfactory in every particular. He and I are both very glad he got a Marks' leg.

* JOHN WATSON—New Zealand. Above elbow.

I can safely say that the artificial arm you supplied me with is unsurpassed in the colony, people when they meet me do not know my arm is off. I can drive a horse with it, and steer a bicycle with the rubber hand, and put the other in my pocket, and can do many other things which make it very useful. June 2, 1904.

WILLIAM WATSON—Traveling Salesman, Alexandria Co., Va.

Since I got your artificial leg I have walked very well with it, and go about everywhere, traveling all over the country. There is but a slight limp in my walking, this is probably due to the shortness of my stump. It has amused me very much to have patent medicine men ask me to try their remedies for rheumatism.

MICHAEL [illegible]
I got [illegible]
years [illegible]
[illegible] City.
403

[illegible]ents who would be better off if their [illegible]y were to wear yours. May 4, 1904.

[illegible]erk, Montgomery Co., Va. Above knee.
[illegible]u made for me, and am wearing it with-[illegible]icely, and I am pleased with it. You made [illegible]as served me well. Dec. 6, 1904.

[illegible]—Farmer, Chenango Co., N. Y. Above knee.
[illegible] your artificial legs for nearly thirteen years, well pleased with it.
[illegible] is a grand invention, no squeaking or getting out [illegible] can be depended upon, and the knee-joint is the

strongest and best I ever saw. I am farming, and do all of my work, such as plowing, sowing, cradling, and everything that a farmer has to do.

* MRS. CARL WEGENER—Linn Co., Ore. Below knee.
I lost my foot in a runaway last June. Amputation four inches above the ankle. I got one of your artificial limbs, and am very much pleased with it; it was fitted from measurements. I am able to do anything with it. May 13, 1904.

JOHN T. WESTCOTT—Watchman, Ulster Co., N. Y. Above knee.
I have been wearing one of your legs since 1895 (over nine years), and my work calls me to be on my feet constantly as night watchman for the Consolidated Cement Co. I am on the move from hour to hour, and that requires a man to have good limbs. Your work is satisfactory, and I recommend the same to everyone. May 6, 1904.

E. J. WESTERN—Herkimer Co., N. Y. Above knee.
I have been wearing your leg for the last ten months, and find it very comfortable. It gives me good satisfaction. May 9, 1904.

* C. W. WHITE—Beaver Co., Okla. Above knee.
I can proudly and honestly say that having worn one of your limbs for about two years, I find it is the best I ever saw, and I have seen many different kinds. My leg is taken off eight inches from the body, and I can go anywhere I want to. I have worked in a store ever since I began wearing my leg. I come in contact with many people that can't tell I have an artificial limb. It is a terrible affliction to lose a limb, but the terror is removed when one can get a limb of your construction to replace it. May 5, 1904.

* FRANCES WHITE—Tailoress, New Zealand. Above knee.
I beg to inform you that I am wearing the leg constantly you made for me. I appreciate it, and speak highly for the merits of your improvement.
I have had two, one from Melbourne, and one from Dunedin, and neither was a success. Therefore I can fully recommend anyone who has had the misfortune to lose a limb, to your firm, for I am sure they will get every satisfaction. My amputation is above the knee. Aug. 30, 1904.

* J. SAMUEL WHITE—Bookkeeper, Brown Co., Ohio. Knee.
It is a great pleasure to say that the leg you made for me almost two years ago has, and is still, giving full satisfaction. I had no trouble in learning to use it, and have not lost a day from work in the past two years. My occupation, bookkeeping in a bank, compels me to stand all the time on a marble floor, and the artificial leg stands the test as well as the sound one. My amputation is through the knee, and I wear one of your end-bearing legs. May 16, 1904.

* MRS. R. D. WHITE—Housewife, Montgomery Co., N. Y.
I have been wearing Marks' artificial limb for the past nine years, my amputation being above the knee. I can do any kind of housework. It is very satisfactory. I do all my work, and do not know how I could get along without it. May 8, 1904.

S. J. WHITE, JR., M. D.—Delaware Co., N. Y.
The artificial leg I obtained for David Penfield was a pronounced success.

* E. T. WHITEMAN—Bartender, Alleghany Co., Md. Below elbow.
I lost my arm on Dec. 14, 1902, and six months later purchased one of your limbs, which has indeed given me great satisfaction. I have worn the hand every day since I received it, and find it very comfortable. Am so accustomed to wearing it I will not go on the street without having it on. I have a position bar tending in a saloon, and I could not do without the hand, and with it I get along as well as a man with two hands. May 16, 1904.

* MISS CALLIE WHITFORD—Age 15, Schoolgirl, Stewart Co., Tenn.
Six years ago I had my leg amputated just above the ankle, and in the January following I got an artificial leg, double slip socket, at first I was well pleased with it, but after a few months it began to give me trouble, and from then I never wore it with any comfort. It only lasted a short time, and then I got yours, which I have been wearing over a year. I live one mile from town, and I can walk there and back as fast as anybody. I can keep up with papa, and he is a fast walker. I would not exchange the rubber foot for any other. June 1, 1904.

W. WHITMAN—Machinist, Albany Co., N. Y. Below knee.
Your leg is O. K. I work in the D. & H. machine shops every day, and it don't bother me at all. May 9, 1904.

* J. L. WILKINS—Machinist, New Hanover Co., N. C. Below elbow.
The artificial limb which I bought of you April, 1902, has given perfect satisfaction in every respect.
My occupation is that of a machinist. I am engineer now with the Angola Lumber Co., of this city, and can attend to my work as well as the general run of engineers. May 4, 1904.

* J. H. WILLARD—Farmer, Buckingham Co., Va. Below knee.

Have worn your leg for fifteen years with great comfort. My occupation is a farmer. I can do most any work a farmer is called

to do, such as plowing, harrowing, etc. My leg is amputated four inches below the knee. I am highly pleased with my leg; it was fitted from measurements. June 6, 1904.

* JOHN WILLIAMS—Clerk, Ireland. Below knee.

Seventeen years ago my right leg was amputated below the knee in Providence Hospital, I was then on the ship *George Thompson*, of Sydney, N. S. W. When able, I was sent to Sydney, where I purchased an artificial leg with ankle joint; it cost me 26 pounds and 5 shillings.

I was never able to wear it constantly, as it hurt me very much and the springs were always breaking, leaving me almost helpless on the street.

When I came to my home in Ireland my friends hearing about a man named McKee, who was wearing one of your make with rubber foot, advised me to try one. I sent you measurements, from which you made my leg, and I never regretted having done so. The change was marvelous.

This leg cannot be beaten for ease and comfort. I am a clerk and timekeeper in a large foundry, and have a great deal of walking from one department to another, but I find no difficulty whatever in going about.

A young man here, who had his leg amputated above the knee, got one from you lately through my recommendation, and can go to dances and otherwise enjoy himself as well as ever he could before losing his leg. May, 1904.

* JOHN B. WILLIAMS—Floyd Co., Ga. Above knee.

On April 12th I received one of your artificial limbs. The finest piece of work I ever saw. I have been on my crutches for ten years. I am about 24 years old. Lost my leg in falling from a wagon, my leg was amputated three and one-half inches from hip. I never dreamed of ever walking without a crutch. After seeing your book on artificial limbs, and guarantee, I decided to buy a limb made from measurements, as per your directions. When I got the limb it was a perfect fit. The second day I threw away my crutches, and am now going about and doing my work well. I am a rural mail carrier. Can harness my horse, roll buggy in and out of

stable. Can truck corn and carry a load. If this limb was the only one, money could not buy it. May 17, 1904.

* PHILIP WILLIAMS—Washington Co., Miss. Below knee.

I desire to let you know of the comfort I have had in wearing the artificial leg made for me in August, 1902. I would not be without the leg for anything. It not only enables me to walk naturally, but enables me to perform my work. It is thoroughly comfortable to wear. May 17, 1904.

SAM T. WILLIAMS—Fireman R. R., Sussex Co., Va. Below knee.

The leg you expressed May 25, 1904, is all O. K. If I could not get another like this one I would not take one thousand dollars for it. I am so glad I came to your house to get my fit. I can fire an engine as well as others. June 22, 1904.

* S. P. WILLIAMS—Sawmill, Alexander Co., N. C. Above knee.

I lost my leg May, 1891, and applied one of your artificial limbs the first of September following, and have been wearing it ever since until recently, I sent a new measure and had another of the same kind made. It is all right, and fits all right. I was running a sawmill. I have walked over some very rough mountains. My leg is amputated three inches above the knee. I do not use a staff, unless I am going to walk a long distance and over rough roads. The one I wore for twelve years cost me very little for repairs. May 19, 1904.

* WALTER A. WILLIAMS—Montgomery Co., Pa. Below knee.

The leg I received from you proved very satisfactory. I have been wearing it every day since I received it. I shall recommend your leg every chance I get. May 21, 1904.

* ROBERT ALFRED WILLIAMSON—Bicyclist, New Zealand.

The leg you made from the measurements I recently sent you fits admirably, and from the very first I was able to walk with

comfort, and with no rattling of joints. I think the rubber foot is a great improvement over the ankle joint.

I work at the bicycle trade, and find the leg a great help to me in every respect, and never have to leave it off on account of soreness. I can thoroughly recommend your leg to all who are afflicted to be the next best to nature's. May 30, 1904.

FRED WILLIE—Farmer, Fulton Co., N. Y. Below knee.
I used an artificial leg of your make for eleven years, and was well pleased with it, and the new one I got of you last fall gives good satisfaction, and I am well pleased with that. My work is heavy, being on a farm and work every day. May 28, 1904.

A. L. WILSON—Real Estate, Osage Co., Kas. Above knee.
In giving a statement of my experience with artificial legs, I have to state that I have, during the past thirty-eight years, used five different makes, and have found the Marks' leg best of all, it being the most simple, most natural, and the most durable. For the last eighteen years I have used only the Marks.
For the past thirteen years I have been engaged in banking; and prior to that my occupation was superintending farming.
During all these years I have done a great deal of walking, driving, and riding in the saddle, and standing at the counter and sitting at the desk. Must say that I have derived a great deal of comfort and satisfaction in the use of the Marks' artificial leg.
July 19, 1904.

DAVID C. WILSON—Foreman in Foundry, Jersey City, N. J.
On the first of September, 1902, I suffered the loss of my right foot above the ankle. I was measured and fitted with an artificial by you nine weeks and a half after the accident, and received the foot at my home in the middle of the eleventh week, and I have worn it right along since then. I am foreman of Messrs. Hitchings & Co.'s Foundry, in Jersey City, and I am as competent, with the aid of my rubber foot, to fill my position as I was previous to the accident. Am on my feet from six o'clock in the morning until late at night, and find no difficulty in getting along.
I take great pleasure in recommending your rubber feet to any who may need them. May 19, 1904.

* MISS E. W. WILSON—Teacher, England. Above knee.
I have been wearing one of your limbs for the past six years, for above knee amputation, and find it most comfortable in every way. I shall be only too pleased to recommend your limb to anyone. I cannot speak too highly of your work. May 9, 1904.

JOHN J. WILSON—Inspector, New York City. Below knee.
Have worn your patent artificial legs for nearly fourteen years, and will make application for a new one from the Government just as soon as the time comes. I have only about three inches below the knee. I am on my leg twelve hours every day.

* HARRY WITT—Bookkeeper, Henry Co., Mo. Above knee.
In the spring of 1897 I met with a railroad accident, which necessitated the amputation of my left leg just above the knee. In the fall of the same year I purchased one of your limbs. I was but thirteen years old, and consequently it was necessary to have my artificial limb lengthened from time to time. This you did for me. I am pleased to say that the leg was satisfactory in every respect.
Until recently I was a high school and business college student, and now am a bookkeeper and stenographer. I get about nicely, and am pleased to recommend the Marks' limb to all. May 21, 1904.

* B. F. WOOD—Mail Carrier, Platte Co., Mo. Above knee.
I can cheerfully recommend your artificial legs. I bought one from you March, 1887, for thigh amputation, a six-inch stump, and have worn it for seventeen years, until a few months ago, when I bought another from you. I have taught school, was in the insurance line for nine years, and am now working for the U. S. Government as R. F. D. Carrier. I can go most anywhere, and get around well. I think your limbs are the best in the world.
May 17, 1904.

JOHN J. WINN, Signal Quartermaster, U. S. S. Oneida.

I write you this simply to say that my experience with your Artificial Limbs, together with considerable experience with other kinds, induces me to prefer yours by all odds. The special point I

desire to mention is the simplicity of construction in your leg, whereby I can take it apart, lubricate and adjust with my one (natural) hand, and put together again without any help. My good, solid weight of 240 pounds gives the leg a good trial, and yet I feel a confidence in it that I never had in any other kind.

EDWIN T. WOOD—Student, Suffolk Co., Mass. Below knee.

I have worn one of your legs, made for an amputation just above the ankle, for seven years, with the utmost comfort and satisfaction. I get about as well as a man with his natural limbs, and many of my friends do not know that I have an artificial one. I can safely say, that in my opinion, your leg is the best made, both in principle and construction. May 19, 1904.

JAMES R. WOOD, M. D.—New York.

I have carefully examined Marks' Artificial Limbs, and believe, because of their simplicity and strength, that they will be sought for by those who may be so unfortunate as to require them.

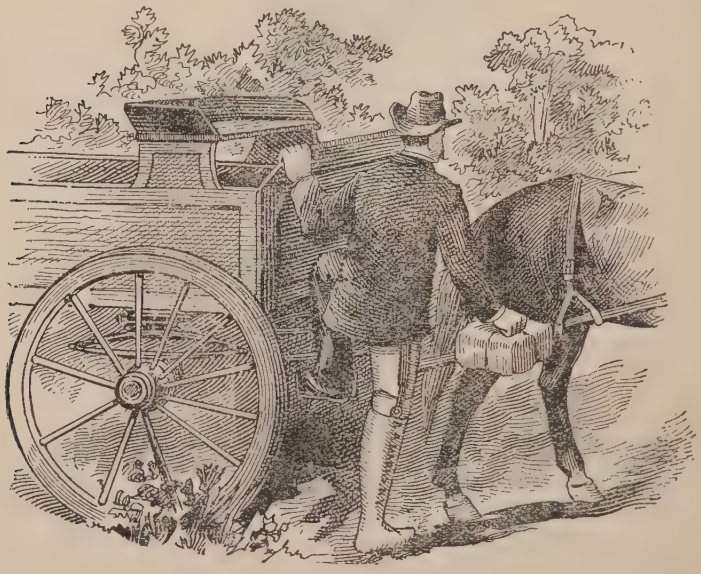
* R. B. WOODS—Engineer, Logan Co., Ky. Below knee.

Have been wearing artificial legs for thirty years. Have tried different kinds; yours is the best that I ever wore. The one I got from you twelve years ago I am wearing yet. Am on my feet all day. At one time I went for six years without losing a day's work. Rubber foot is much better than ankle-joint one. May 19, 1904.

* MRS. MARY WOOLARD—Housekeeper, Heckman Co., Tenn.
The artificial hand I ordered from you last June has proven to be a great help to me. The longer I wear it the better I like it. I do not see how I could get along without it now. I wish you great success with your artificial limbs. May 16, 1904.

GEORGE WORMULD—Groom, New York City, N. Y. Above knee.
Six months ago you supplied me with one of your artificial legs, for an amputation above the knee, and I have been wearing it ever since. I am pleased to say that it has given every satisfaction. I am now walking on it without the aid of even a cane, and I am pleased to say it has enabled me to continue in my employment. June 25, 1904.

* HERBERT WRIGHT—New Zealand. Below knee.
I take pleasure in testifying to the satisfaction I have derived from the use of your artificial limb. It is nearly seven years ago



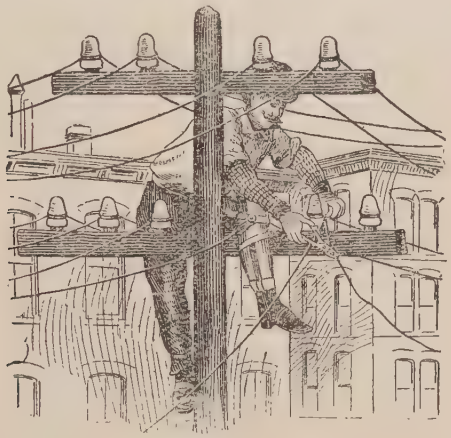
since I received it from you. I am a farmer, and have done all kinds of rough farm work successfully. At times I have severely tested the rubber foot in lifting heavy weights, and it has stood the work remarkably well. I shall always remain grateful, and I would say to all who unfortunately need an artificial limb, "by all means secure one from A. A. Marks."

FRED G. WYMAN—Telegraph Operator, Broome Co., N. Y.
Eight years ago I bought one of your artificial limbs, and have worn it continuously ever since, not having the least trouble. It never gets out of order, and is always very comfortable. My amputation is about two inches below the knee. I am on it from morning until night, and there is not one of my acquaintances who would ever suspect that I wore an artificial leg from my walk, even my intimate friends, when I tell them, they say, "I would never have believed it." May 16, 1904.

* MISS HARRIET YATES—Muscogee Co., Ga. Below knee.
My artificial leg has given perfect satisfaction, and I walk on it every day, and as my occupation is dressmaking I am obliged to be on it a great deal. I have never felt the least inconvenience, and am proud to say it has given me a great deal of comfort.
May 13, 1904.

* ABSOLON M. YGLESIAS—Lima, Peru, South America.
I take great pleasure in assuring you that the artificial leg which I ordered of you to replace the one I lost in the engagement of August 27, 1884, has proved to my entire satisfaction. It is just that I should recommend your work, since I have been enabled to avail myself of it to such advantage.

ALVAH YOUNG—Wireman, Boston, Mass. Below knee.
Alvah Young, employed by The Edison General Electric Co., New England Division, 38 Pearl Street, Boston, Mass., as a lineman, is a living example of the remarkable degree to which rubber feet



restore lost members. He lost one of his legs some years ago in a railroad accident. He had a Marks' rubber foot and artificial leg applied, and since then has engaged in active manual labor, earning his livelihood. He will climb a pole as dexterously as any of his associates, hold himself on the cross-bar with his artificial, and place the wires in a thorough workmanlike way.

* HENRY G. YOUNG—Teamster, Rockingham Co., N. H.
The artificial arm I purchased of you five months ago has given good satisfaction. I am a teamster by occupation, and the hook is a great help, I remove the hand at the wrist and use the hook in my work. My arm is made so strong that I can take heavy lifts with it and do my other work well. It has given me excellent service.
May 18, 1904.

JOHN YOUNG—Flagman, Middlesex Co., N. J. Above knee.
I have been wearing an artificial leg for the last twenty-one years. My leg is amputated above the knee. I am employed by the Pennsylvania R. R. Co. as flagman and have been for the last twenty-two years. I am wearing the leg with satisfaction.
May 21, 1904.

* JUSTO YSUSQUIZA—Farmer, Mexico. Above knee.

I have been wearing one of your artificial legs for three years and I am satisfied with it. The rubber foot is an admirable invention, noiseless and almost natural. My profession is agriculture and my occupation is in the saddle all day. I mount and dismount with ease and without any assistance. My amputation is four inches above the right knee, but I can say that I have not lost anything, with the assistance of the artificial leg constructed in your factory, the merits of which are strength and ease in walking, I know no better. To everybody in need of an artificial limb I recommend him to apply to your factory.—Translated from Spanish. July 10, 1904.

* ALVA J. ZABRISKIE—Beaver Co., Utah. Knee.

I am wearing the leg I ordered from you sometime ago satisfactorily, and think the Marks' leg all right. I advise everyone that needs one to buy of you. You can beat the world on artificial limbs. April 29, 1904.

* ANGEL ZEVALA Y MADERO—Mexico. Below knee.

I have the pleasure to state that the artificial leg constructed by you for me, for amputation below the knee, is so natural that persons who were not aware of the operation which I underwent scarcely believe I am lame. I have returned to my former employment and I only experience natural fatigue.—Translated from Spanish. April 23, 1901.

CHAPTER XXXVIII

HINTS FOR THOSE VISITING NEW YORK CITY

We have endeavored to emphasize the fact that personal fittings for simple amputations are, as a rule, unnecessary and that we do not advise anyone to go to the expense and annoyance incident to visiting the manufacturer without first making the attempt by measurements, and in order to place the attempt on a basis of safety to the wearer, we obligate ourselves to make all alterations and refittings that are necessary without extra charge.

It is also emphatically stated that amputations leaving stumps with abnormal conditions, incapable of being explained either descriptively, diagrammatically or by casts, and all deformity cases, are exceptions and must be fitted personally. Those who decide to come to us for personal attention will be welcomed and promptly attended to on their arrival.

WHERE WE ARE LOCATED.—We are located at 701 Broadway, one door above Fourth Street. This, as will be seen by consulting the map on following pages, is central to and accessible by electric, surface, elevated and subway cars. A person arriving at any point can take a car to Broadway and be transferred to a car that will convey him to our door. The system of transfers in New York is very complete and accommodating. One fare (five cents) includes transfer.

WE MEET PATRONS.—We will meet any person on arrival if we are made acquainted with particulars a day or two in advance. The day, the time of arrival, and the point (station, ferry or pier), must be clearly given. If the arrival occurs after business hours it will be well to go to some reputable hotel near by and remain oven night, we suggest the Broadway Central Hotel, 671 Broadway, which is within three hundred feet of our establishment. We can be reached by telephone from any point.

BUSINESS HOURS.—Our establishment is open from seven in the morning until five in the afternoon, except Saturdays, when we close at three o'clock. We are not open Sundays and Holidays.

DISTANCE FROM ARRIVING POINTS.—For the information of those who choose to be conveyed in a carriage, we will state that the city ordinance permits the driver of a one horse hack to charge one dollar for conveying one or two passengers a distance not exceeding two miles, and one dollar and a half for two miles, not exceeding three. As we are located within two miles of every railroad and steamboat terminal, it will be seen that one dollar or one dollar and a half is the most that legally can be charged. When a two horse vehicle is engaged, or when more than two persons are to be conveyed, the charge will be greater. It is always best to make a bargain with the driver before entering his vehicle. No person need consider it necessary to be conveyed by a carriage; elevated, surface, and subway cars will, for five cents, convey him to or very close to our store. Those conveyances run at close intervals day and night. Policemen can always be found at stations, ferries, and piers. Their duties are not only to protect persons and property but to give such directions and information as may be needed.

BOARD AND LODGING.—Accommodations can be obtained at reason-

Desbrosses St.
Barclay St. Ferry to Hoboken
Cortlandt St. Ferry
Pavonia Ferry
Communipaw Ferry to Liberty St. (Summer only)
Pennsylvania R.R. Annex
Communipaw Ferry to Marshall St.
Pennsylvania R.R. Annex
Goat Island
Hudson River
EAST
RIVER
WALLABOUT BAY
NAVY YARD
CHANNEL
DRY DOCK
BROADWAY
WEST

TWELFTH
ELEVENTH AVE
TENTH AVE
NINTH AVE
EIGHTH AVE
SEVENTH AVE
SIXTH AVE
FIFTH AVE
FOURTH AVE
THIRD AVE
SECOND AVE
FIRST AVE
MADISON
PARK
LEXINGTON
IRVING PL
WASHINGTON SQ
WASHINGTON PL
WAVERLY PL
GRAMERCY PARK
MADISON SQ
UNION SQ
Blackwell's and Roosevelts
26th St. Ferry to
42nd St. Ferry to Broadway, Brooklyn
MAN O' WAR REEF
BLACKWELL'S
Broadway Ferry to E. 23rd St.
Long Island
Greenpoint Ferry to
R.R.
ARDOX
PALMERS DOCKS
NEWTOWN
PKS
LIMBS

able rates, furnished rooms in private houses can be rented from two to five dollars per week, according to location. Table board can be had at from three to five dollars per week. Rooms in hotels without board, vary from fifty cents to two dollars per night, according to hotel and location of room, with board from two to five dollars per day. A person coming to New York expecting to remain a week or more, and wishing to keep his expenses down, can engage a furnished room and eat in restaurants, his living expenses while here can thus be kept within narrow limits. The Mills House, located at 164 Bleecker Street, is within half a mile of us. This is one of a system of hotels conducted for the accommodation of respectable men of small means. A room can be had for twenty cents per night, meals at fifteen cents each.

WHERE TO HAVE YOUR MAIL ADDRESSED.—Upon leaving home, instructions should be given that letters and telegrams should be addressed in the care of A. A. Marks, 701 Broadway, New York City.

Our patrons are welcome to the accommodation of a fireproof safe in which valuables can be deposited. They have the liberty of our premises while in New York, and if they are shopping they can have their goods delivered at our store. They can make engagements to meet parties here and have the exclusive use of private rooms for private interviews.

CALLS MADE TO RESIDENCES.—Persons will be attended to at their residences, no matter where they may reside, if expenses and extra time are paid for.

WOMEN IN ATTENDANCE.—Women who prefer to be waited upon by one of their own sex will find women in our office for their accommodation.

BRANCHES.—We have no manufacturing branches. Our factory is located in New York City and in no other place. Our profession is like that of a surgeon. Our skill and judgment cannot be relegated to one in charge of a branch establishment. If we were to establish branches we would have to place them under the management of others and would, more or less, jeopardize the welfare of our patrons. As substitutes for branches our system of fitting from measurements has been devised and has been found adequate.

If the reader desires to order a limb and does not care to take measurements himself, he can call upon his physician or druggist, or upon one whom we will designate.

CHAPTER XXXIX

STUMP SOCKS. FOR ARTIFICIAL LIMB WEARERS

COTTON, WOOL, AND SILKATEEN

A stump bears the same relation to an artificial leg that a natural foot does to a shoe. Comfort and cleanliness demand that a sock should be worn on the stump, the same as on the foot.

A sock in either case provides a medium for collecting and absorbing the particles of waste and moisture that are thrown off from the skin, and by removing the socks, airing, and frequently washing them, the stump will be kept in a more healthy condition, and the socket of the leg will be better cared for.

There are persons who do not use socks, but wear their artificial limbs directly to their stumps, and permit the sockets to collect and absorb the excretions of the skin, and when the sockets become foul with the collection of effete matter, they are scraped out and

No. 1245.

No. 1246.

No. 1247.

revarnished. This method cannot be condemned too strongly. The stump, as well as the artificial leg, suffers from such treatment.

Every wearer of an artificial limb should be provided with an ample supply of socks, so that frequent changes can be made. The same regard should be given to the stump as is given to the natural foot. If a stump perspires excessively, changes should be made more frequently.

We manufacture our own socks, and keep a large stock on hand and are able to fill orders promptly.

Our socks are made of cotton, wool, and silkateen.

Cotton socks are knit of choice staple, they are durable and pleasant to wear; they are preferred by those who cannot endure wool.

Woolen socks are knit from yarn especially prepared for the purpose; the yarn is the best and softest that can be procured, with only enough twist to make it wear well. It is absolutely free from cotton or any foreign fiber.

Silkateen socks are made from exceptionally fine thread, they are knit on a machine constructed for the purpose; meshes are small, sixteen stitches to the inch, much finer than socks made from cotton

or wool. These socks are especially suitable for tender and delicate stumps. Silkateen is a comparatively new thread; it is strong and will stand the effects of wear a great length of time. It has a luster resembling silk; it is very smooth and soft to the touch.

Cotton and woolen socks are made in two colors, white or brown, silkateen socks are of a natural grayish tint.

Our stock consists of eleven different sizes, ranging from ten to thirty-six inches in length, and in width to fit any ordinary limb.

In ordering socks the following measurements should be given:

Length of Sock. Circumference at top of Stump, 4 inches from top, 8 inches from top, 12 inches from top, 16 inches from top, 20 inches from top, 24 inches from top, 28 inches from top.

Some persons use a long sock to cover the stump to the body, and a shorter one to cover the stump to the joint (knee or elbow).

When a short one is needed, give only the length and circumferences of that part of the limb that is to be covered.

The following schedule will enable anyone to determine the sizes and the prices of the socks required.

Sizes in inches.			Cotton.		Woolen.		Silkateen.	
No.	Length of sock.	Circumference at largest part of stump.	Price each.	Price per dozen.	Price each.	Price per dozen.	Price each.	Price per dozen.
0.	1 to 10	Under 15	$0.20	$2.00	$0.40	$4.00	$0.60	$6.00
1.	10 to 15	" 15	.30	3.00	.50	5.00	.70	7.00
2.	10 to 15	Over 15	.40	4.00	.60	6 00	.80	8.00
3.	15 to 20	Under 15	.40	4.00	.60	6.00	.80	8.00
4.	15 to 20	Over 15	.50	5.00	.70	7.00	.90	9 00
5.	20 to 25	Under 15	.50	5.00	.70	7.00	.90	9.00
6.	20 to 25	Over 15	.60	6.00	.80	8.00	1.00	10.00
7.	25 to 30	Under 15	.60	6.00	.80	8.00	1.00	10.00
8.	25 to 30	Over 15	.70	7.00	.90	9.00	1.10	11.00
9.	30 to 35	Under 15	.70	7.00	.90	9.00	1.10	11.00
10.	30 to 35	Over 15	.80	8.00	1.00	10.00	1.20	12.00

One-quarter or one-half dozen of the same kind and size sold at dozen rates.

When a short sock in addition to a full-length one to come only to the knee-joint is desired Nos. 0, 1, or 3 will be suitable.

In determining the number of size, five inches should be added to the length of the stump to allow for turning over the top of leg and the shortening caused by the stretch in drawing on the stump.

Elastic Webbings, 2 inches wide, 60c. per yard; 1½ inch wide, 50c per yard; 1 inch wide, 40c. per yard.

Non-Elastic Webbings, 2 inches wide, 30c. per yard; 1½ inch wide, 25c. per yard; 1 inch wide, 20c. per yard.

Clamp Buckles with Snap, 1½ and 2 inches, 25c. each; Snaps, 1½ and 2 inches, 15c. each.

Socks and Supplies will be sent postpaid if remittance accompanies the order.

Remittance can be made by postage stamps, money order, registered letter, express, or draft on New York. No goods will be sent C. O. D. unless one-half the price is enclosed with the order.

Address: A. A. MARKS, 701 Broadway, New York City.

CHAPTER XL

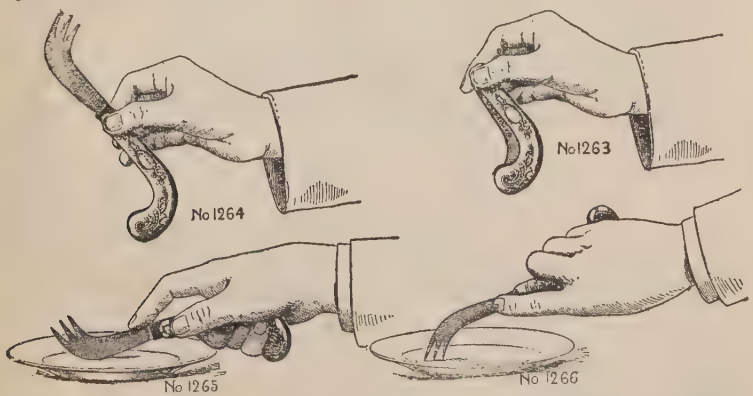
MISCELLANY

MARKS' IMPROVED FOLDING KNIFE AND FORK

Operated by a press button. Press the button and the blade flies open. CUT REPRESENTS THREE-QUARTER SIZE.

The combination knife and fork illustrated here is designed for the convenience of those who are temporarily or permanently disabled in one hand, either right or left. A lock and spring are imbedded in the knife, which operate on the blade. No. 1263 represents the closed knife with thumb applied to the press button.

The moment a little pressure is applied to this button the blade will fly open and become locked, as shown in No. 1264. When opened, a piece of meat can be cut on the plate by a rolling motion given to the knife, as represented in No. 1265; the knife can be inverted by twisting the hand (see No. 1266), and food conveyed to the mouth by means of the fork. The blade cannot close when pressure is



applied to the fork. Butter can be spread upon bread, potatoes mashed, and other services performed. Pressure applied to the press button will release the lock, and the knife can be closed and locked and carried in the pocket. The blade is made of steel, and the handle of aluminum. It is very strong and durable. Price $2.00, postpaid.

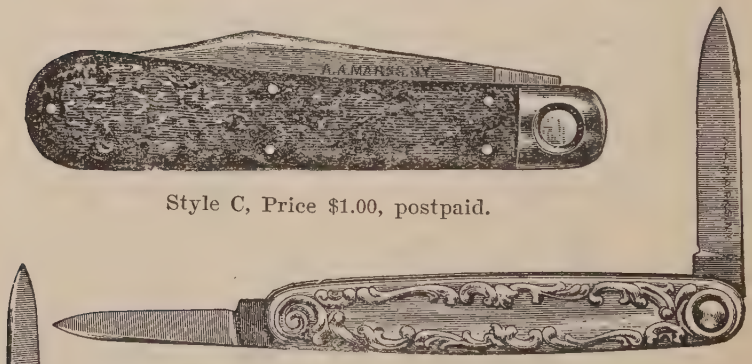
PRESS-BUTTON POCKET KNIVES.—HANDY FOR ANYONE—ONE HAND DOES IT ALL

The press-button feature, as described on the preceding page, is here combined with an ordinary pocket knife. Many persons have broken their nails and made their thumbs sore by pulling open blades of the ordinary pocket knife. The feature of locking the blade when open, as well as when closed, is another valuable improvement. Probably every person who has used a penknife to any considerable degree can recall the experience of having the blade close upon their fingers unexpectedly. The press-button feature removes this danger. The knife cannot be opened, and when opened cannot be closed, unless pressure be applied to the press button. The moment pressure is applied, the blade opens and becomes locked. We have a variety of shapes and sizes that we are offering to the public, especially to those who have lost one hand. The blades are made of the finest Sheffield steel.

CUTS REPRESENT THREE-QUARTER SIZE.

Style B, Price $1.25, postpaid.

Style C, Price $1.00, postpaid.



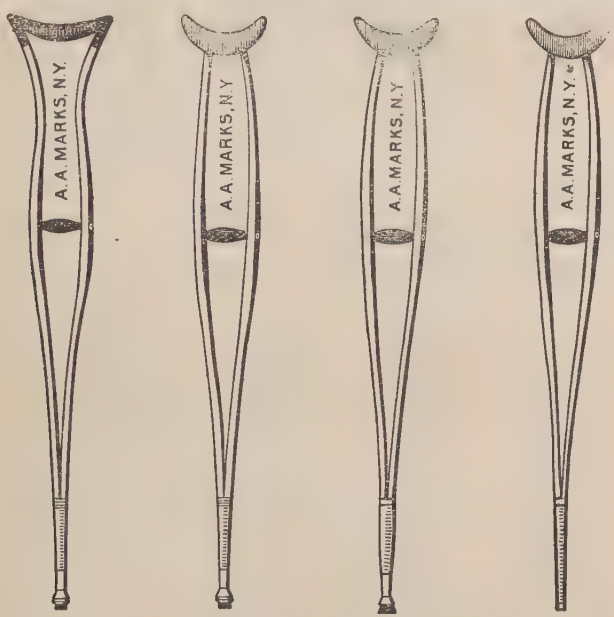
Style D, Two Blades, Price $1.00, postpaid.

Style E, Blade and Button Hook, Price $1.00, postpaid.

CRUTCHES

The crutches offered here are of exceptionally good quality; they are neat in design, strong, reliable, and elegantly finished, especial care being given to their construction and the selection of material. Rock maple is found to be the most desirable wood, and is used more extensively than any other. Rosewood is also used; it is a dark-colored wood, and when highly finished makes crutches that are rich and elegant in appearance.

The hand rests are secured to the side bars by coppered Bessemer steel rods passing through them and riveted to each side bar.



No. 1268 No. 1269 No. 1270 No. 1271

This is an improvement upon the older method, viz., placing the hand-rests between the side bars and securing them by screws. Many crutches have broken and let their wearers fall, simply because the hand-rests were not properly secured.

Awarded a Diploma of Honorable Mention by the Paris Exposition, 1900.

No. 1268. Whittemore pattern. Side bars of straight-grain timber, steamed and bent, arm-rest of genuine pebble goat with strong duck lining stuffed with curled hair, and firmly secured to each side bar; the soft top, yielding under the weight of the wearer, makes a delightful rest for the arm; patent clamp ferrule No. 1277 is used. All trimmings nickel-plated. The crutch is elegantly polished. Price, per pair—rosewood, $8.50; rock maple, $6.50. Single crutch, rosewood, $5.00; rock maple, $4.00.

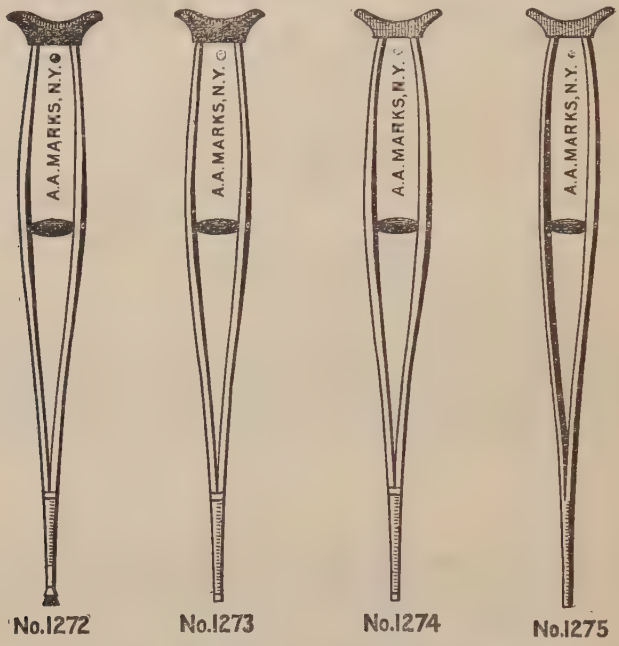
No. 1269. Arm-rest is carved to the shape of a cow's horn and highly polished. It is therefore called the cow-horn crutch; some experienced crutch-wearers say that a hardwood arm-rest, highly polished, is more pleasant than the padded soft one, as it does not

wear the clothing or cramp the shoulder; patent clamp ferrule No. 1277 is used; nickel-plate trimmings. Price, per pair, rosewood, with rosewood arm- and hand-rests, $8.50. Price, per pair, rock maple, with cherry arm- and hand-rests, $4.25. Single crutch, rosewood, $5.00; rock maple, $2.50.

No. 1270, same as No. 1269, rock maple, except that ferrule No. 1288 is used on bottom, nickel-plate trimmings. Price, per pair, rock maple, $3.25; single crutch, $2.00.

No. 1271, same as No. 1269, except that brass trimmings are used. Price, per pair, $2.50. Single crutch, $1.50.

No. 1272. Side bars rock maple, cherry hand-rest, arm-rest up-



holstered with hair covered with enameled leather; ferrule No. 1288 is used, nickel-plate trimmings. Price, per pair, rock maple, stained black or ebonized, $4.50. Price, per pair, rock maple, natural color, $3.50. Single crutch, ebonized, $2.50; natural color, $2.00.

No. 1273, same as 1272, excepting that brass trimmings are used. Price, per pair, rock maple, $2.75. Single crutch, $1.50.

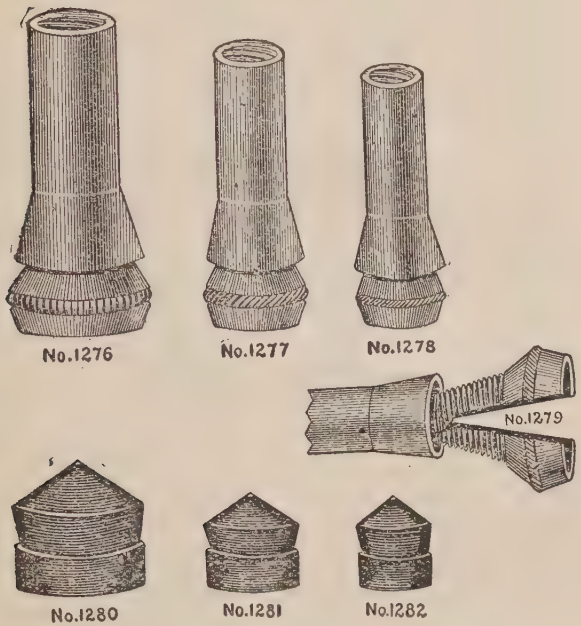
No. 1274. Side bars rock maple, cherry hand- and arm-rests, not upholstered; brass ferrule on bottom. Price, per pair, rock maple, $2.00. Single crutch, $1.25.

No. 1275. Side bars rock maple, cherry hand- and arm-rests; side bars are one piece, split from the top to nearly the bottom, where they are riveted; the bottom is without ferrule. Price, per pair, $1.50. Single crutch, $1.00.

In ordering, indicate the style you want by the number and price. Give the length from the arm-pit to the floor when the arm is hanging by the side and the person standing erect, with shoe on foot. Address, A. A. Marks, 701 Broadway, New York City.

CRUTCH FERRULES AND CRUTCH RUBBERS

CUTS REPRESENT ONE-HALF SIZE



No. 1276. Patent clamp ferrule, heavy brass, nickel-plated, will screw on the end of a crutch one inch in diameter.

Price, per pair, including No. 1280 tips, . . . $2.50

No. 1277. Patent clamp ferrule, heavy brass, nickle-plated; will screw on the end of a crutch three-quarters of an inch in diameter.

Price, per pair, including No. 1281 tips, . . . $2.00

No. 1278. Patent clamp ferrule, heavy brass, nickel-plated; will screw on the end of a crutch or cane one-half inch in diameter.

Price, per pair, including No. 1282 tips, . . $1.75

No. 1279 merely illustrates the patent clamp ferrule with jaws distended; by unscrewing the jaws they can be opened, when a rubber tip can be placed between them; by screwing them up tightly they close and hold the tip securely.

No. 1280. Rubber tip, with base one and one-quarter inch in diameter (fit No. 1276 ferrule). Price, per pair, . . $0.30

No. 1281. Rubber tip, with base one inch in diameter (fit No. 1277 ferrule). Price, per pair, ... $0.15

No. 1282. Rubber tip, with base three-quarters inch in diameter (fit No. 1278 ferrule). Price, per pair, ... $0.10

No. 1287. Heavy brass ferrule, nickel-plated; will screw on the end of a crutch one inch in diameter.

Price, per pair, including No. 1290 tips, . . . $1.25

No. 1288. Heavy brass ferrule, nickel-plated; will screw on the end of a crutch three-quarters of an inch in diameter.

Price, per pair, including No. 1291 tips, . . . $1.00

No. 1289. Heavy brass ferrule, nickel-plated; will screw on the end of a crutch or cane one-half inch in diameter.

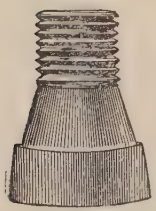
Price, per pair, including No. 1292 tips, . . $0.75

No. 1287

No. 1288

No. 1289

No. 1300


No. 1290

No. 1291

No. 1292

No. 1290. Rubber screw tip, base one and one-half inch in diameter; will screw in the end of No. 1287 ferrule.

Price, per pair, ... $0.40

No. 1291. Rubber screw tip, base one and one-quarter inch in diameter; will screw in the end of No. 1288 ferrule.

Price, per pair, ... $0.20

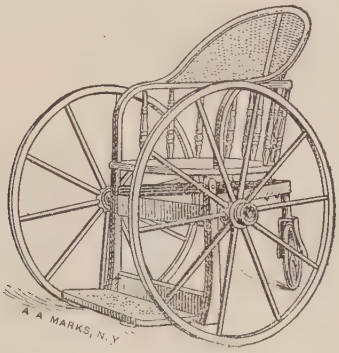
No. 1292. Rubber screw tip, base one inch in diameter; will screw in the end of No. 1289 ferrule. Price, per pair, . $0.15

No. 1300. Rubber ferrules are made in several sizes to fit the ends of crutches and canes; they slip on the ends of crutches and take the place of brass ferrules; they provide a soft medium between the end of the crutch and the ground; they prevent slipping and obviate noise and marring the floors; they are not as durable as any of the rubber tips previously described.

Prices as follows:

1300—15.	Diameter of hole, ⅜ in., base, ¾ in., per pair, . .	$0.20
1300—16.	" " ½ " " ⅞ " " " . .	.20
1300—17.	" " ⅝ " " 1¼ " " " . .	.20
1300—18.	" " ¾ " " 1¼ " " " . .	.20
1300—19.	" " ⅞ " " 1½ " " " . .	.25
1300—20.	" " 1 " " 1½ " " " . .	.25
1300—21.	" " 1⅛ " " 1¾ " " " . .	.25
1300—39.	Diameter of hole, 1½ in., base, 2½ in., each, (Suitable for peg legs.) . .	1.00
1300—44.	Diameter of hole, 1⅞ in., base 3 in., each, (Suitable for peg legs.) . .	1.50

INVALID RECLINING AND ROLLING CHAIRS—FOR SALE OR TO RENT

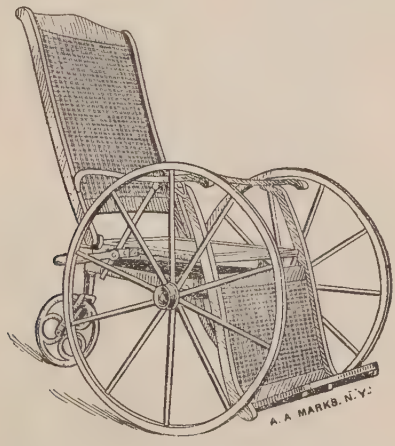


No. 1351.

No. 1351. Invalid Rolling Chair, not reclining.

Height of back from seat	21½ in.
Width of seat	18 in.
Depth of seat from front to back	17 in.
Height of seat from floor	20 in.
Height of seat from foot-board	17 in.
Height of wheels	30 in.

Price, oak, $16.00; hand rims, $2.00 extra. Rental, $1.00 per week.

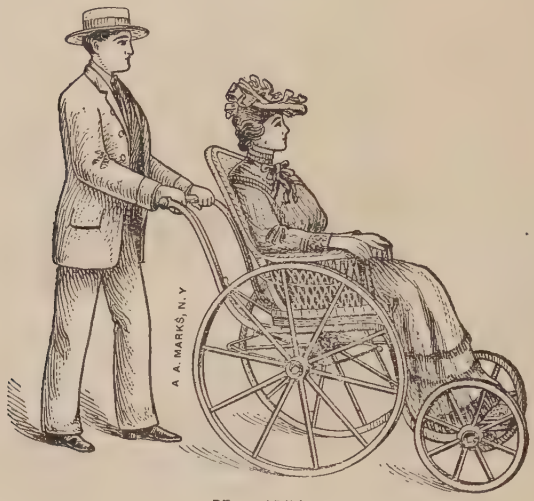


No. 1352.

No. 1352. Invalid Reclining Rolling Chair.
Easily adjusted to any position, from upright to recumbent.

Height of back from seat	34 in.
Height of seat from floor	20 in.
Height of seat from foot-board	17 in.
Depth of seat, front to back	19 in.
Height of wheels	30 in.
Width of seat	19 in.

Price, oak, $25.00; hand rims, $2.00 extra. Rental, $1.50 per week.

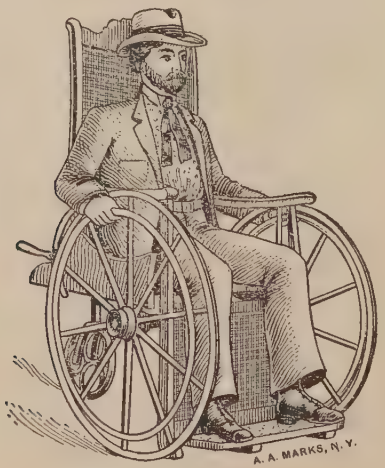


No. 1354.

No. 1354. Invalid Rolling Chair, seat resting on springs, for street use, pushed by an attendant; the front wheels can be lifted from the ground in passing over obstructions.

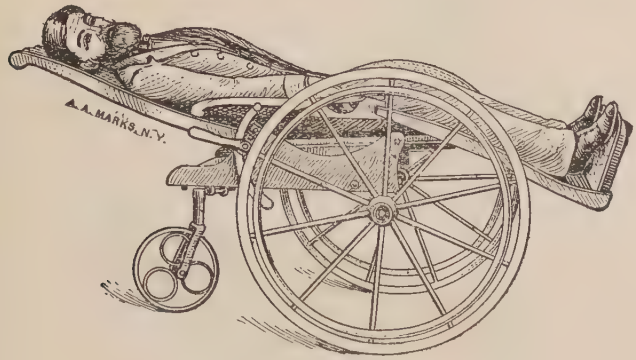
Height of back from seat	26 in.
Height of back wheels	28 in.
Height of front wheels	14 in.
Height of seat from floor	23 in.
Height of seat from foot-board	15 in.
Width of seat	18 in.

Price, $31.00. Rental, $2.00 per week.



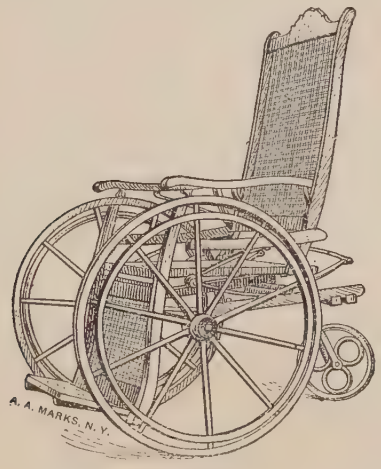
No. 1355.

Nos. 1355 & 1356. Invalid Reclining Rolling Chair. Any position can be obtained by the occupant, from upright to recumbent (Cut 1356); a handle fastens the chair in any desired position; wheels have hand rims for street use.



No. 1356.

Height of back from seat ..... 34 in.
Width of seat ..... 19 in.
Depth of seat from front to back ..... 19 in.
Height of seat from floor ..... 20 in.
Height of seat from foot-board ..... 17 in.
Height of arms above seat ..... 10 in.
Height of wheels ..... 30 in.
Price, oak, $34.00; black walnut, $37.00. Rental, $2.00 per week.



No. 1357.

No. 1357. Invalid Reclining Rolling Chair, with Elliptical Springs placed under the seat, thus preventing the jar caused by rolling over uneven ground. Adjustable by the occupant to any angles from reclining to recumbent.

Height of back from seat ..... 34 in.
Height of wheels ..... 30 in.
Height of arms above seat ..... 10 in.
Height of seat from floor ..... 23 in.
Height of seat from foot-board ..... 17 in.
Width of seat ..... 19 in.
Depth of seat ..... 19 in.
Price, oak, $37.00; black walnut, $40.00. Rental, $2.00 per week.

No. 1358.

No. 1358. Invalid Reclining Rolling Chair, with divided extension foot-rests, peculiarly suitable for persons who desire to have the foot-rests adjustable and independent of each other. The occupant can control the operations of either leg-rest as well as the back. The foot-rests are not only capable of being placed at different angles, but can be lengthened to accommodate any leg.

Dimensions same as No. 1355 and No. 1356.

Price, oak, $39.00; black walnut, $42.00.

Rental, $2.50 per week.

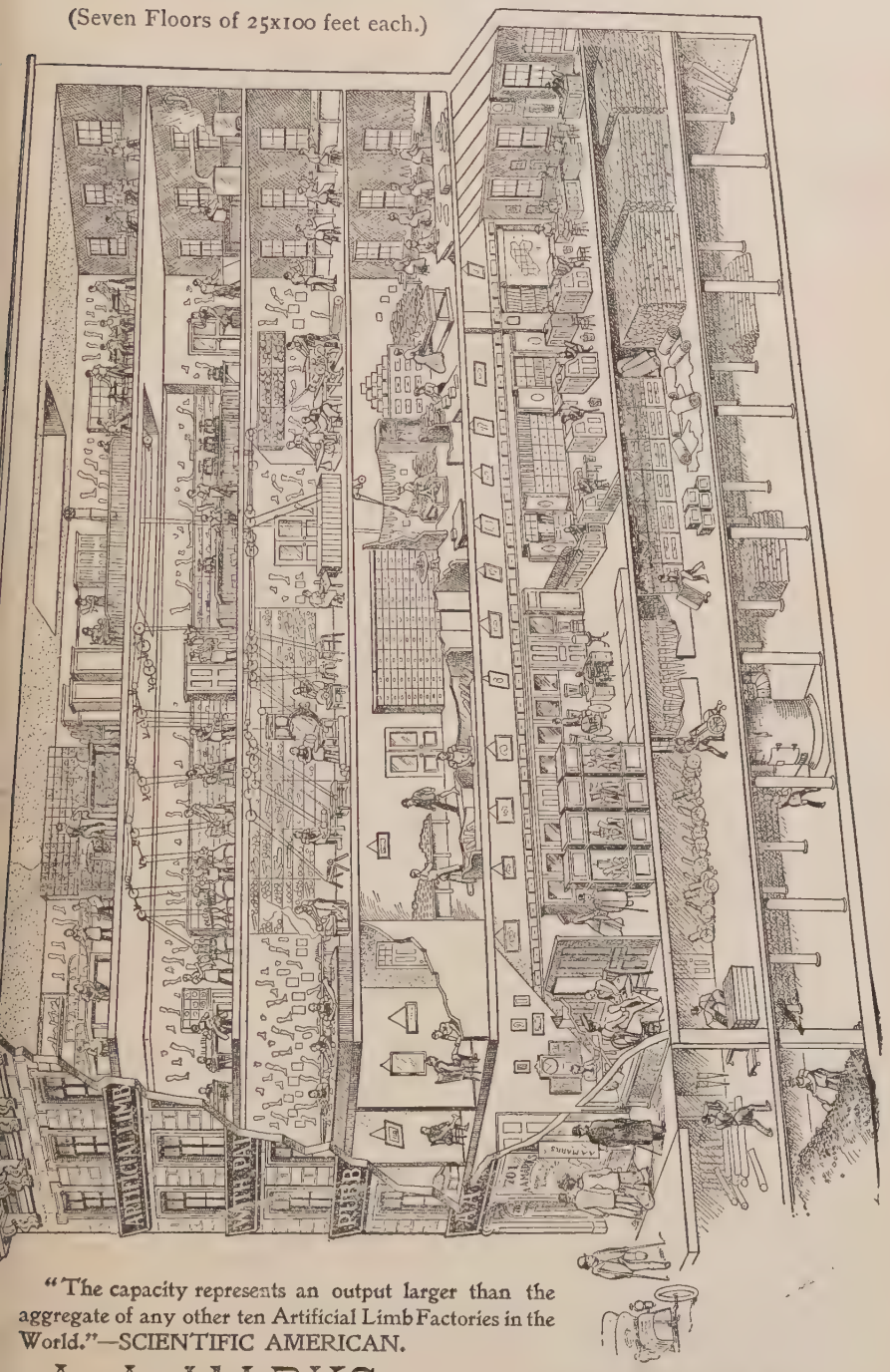
All the preceding chairs have seats and backs caned. They are strong, light, and neat, capable of passing through 28-inch doorway.

Chairs for children and persons weighing over 200 pounds are made to order.

Address: A. A. MARKS, 701 Broadway, New York City.

INTERIOR OF THE LARGEST ARTIFICIAL LIMB MANUFACTORY IN THE WORLD.

(Seven Floors of 25x100 feet each.)



"The capacity represents an output larger than the aggregate of any other ten Artificial Limb Factories in the World."—SCIENTIFIC AMERICAN.

A. A. MARKS, 701 Broadway, NEW YORK CITY.